

MARINE REVIEW

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SHIP BUILDING--AMERICA'S GROWING INDUSTRY.

The new torpedo boat Bailey was launched on Wednesday of this week at the ship yard of the Gas Engine & Power Co. at Morris Heights, New York city. She is the first United States war vessel to be launched on the Hudson. The boat was authorized at a contract price of \$210,000 on March 3, 1897, with a required speed of 30 knots per hour. She is 205 feet long with a maximum beam of 19 feet and a displacement of 235 tons. Her armament will consist of two Whitehead 18-inch torpedo tubes and four semi-automatic quick-firing six-pounders. Miss Florence Beckman Bailey christened the boat, breaking a bottle of American champagne over the bow. Miss Bailey is the granddaughter of the late Rear Admiral Bailey. This boat is fitted with a complete outfit of bilge, fire, feed and sanitary pumps of the Blake simplex type.

Samuel Ayres & Son of Upper Nyack, N. Y., report the great activity at their ship yard. They are at present filling an order for thirty electric launches, each 30 feet in length, for the Electric Launch Co. of Morris Heights, New York city. They are also building a vessel of 130 feet length for Charles R. Flint of New York city. This vessel, which was designed by C. D. Mosher, naval architect of New York, is of steel and aluminum frame and all the planking is to be of mahogany. She is fitted with engines of 4,000 horse power and it is claimed she will attain a speed of 42½ miles an hour. The boat is to be completed by June 1, 1900.

The tug John Fleming, building for Brown & Fleming of 129 Broad street, New York city, was launched a few days ago from the ship yard of Peter L. Colon & Sons at Claremont, Jersey City, N. J. The Fleming is a very strong tug. She is 111 feet in length, 24 feet beam and 11 feet depth of hold. John W. Sullivan of South Street, New York city will supply the engine, the cylinders of which will measure 20 and 40 inches diameter and 28 inches stroke. Steam will be furnished by a Watkins & Dixon type of boiler furnished by Heipershausen Bros. Morison corrugated furnaces will be used.

It is rumored in New York city that a company is being formed in which Pennsylvania railroad interests are largely represented, and which will operate a line of express steamboats between New York and Boston. It is claimed that the capitalization of the organization will be fully \$10,000,000, and that the company will enter the field in which the New York, New Haven & Hartford railroad now enjoys a monopoly. It is the intention of the new company, according to rumor, to provide vessels of high speed and to have them run through to Boston.

The Fore River Engine Co., Weymouth, Mass., will enlarge its plant as rapidly as possible in consequence of having secured the contract for the construction of the United States cruiser Des Moines. At present 350 men are employed, but as soon as new shops and machines can be provided the force will be increased by fully 300.

Increasing business has compelled the boat building firm of Wyckoff Bros. & Taylor to remove their plant to the mouth of the Indian river, Clinton, Conn. One of the contracts on which the firm is now at work is for a 45-foot launch for W. A. Rumpf of Boston, Mass.

Moran Bros. of Seattle, Wash., have secured from Capt. E. E. Caine of the same city, a contract for a four-masted schooner. She will be 196 feet in length, 39 feet beam and 15 feet depth and will cost \$50,000. The vessel will be employed in the lumber carrying trade.

At the Roach yard, Chester, Pa., the joiner deck is now going on the Pennsylvania, which will be the next vessel launched, and frames are ready to go up on the two large steamers building for the Hawaiian service.

The yard of Enoch Moore & Sons Co., Wilmington, Del., is crowded with work. Among the vessels building is a tank barge for the Standard Oil Co.

A REMARKABLE SEASON.

If the vessel owners who are taking chances in trying to run some of their ships without insurance until well into the middle of the present month do not meet with serious trouble, the 1899 season of navigation will have proven one of the most remarkable in the history of lake navigation, not only in the matter of profitable freights for the vessels that were not tied up by contracts, but also from the standpoint of freedom from accidents. Heavy losses were sustained on account of the blockades in the Sault river, but the season has been one almost entirely free of storms. The oldest vessel men can not remember another year when October and November passed without a blow of some kind injurious to shipping. This year there have been practically no disasters due to stress of weather. The insurance companies have made money, but they had been doing business for several years with very little if any profit. A few owners will insure themselves ore cargoes that will be carried in their uninsured vessels during the next ten days. They are, of course, taking very great chances. A couple of steamers taking coal to the head of Lake Superior will not leave Lake Erie ports until Friday or Saturday next. This is very late sailing.

Probably the highest freight of the year was that paid a short time ago to James Davidson of West Bay City, on a small block of ore from the head of Lake Superior to Detroit—\$2.50 a ton.

One of the first measures introduced in the new congress was a joint resolution by Representative T. E. Burton of Ohio for the abrogation of the treaty of 1817 with Great Britain so far as it relates to the building of war ships on the great lakes.

MARINE EXHIBIT AT PARIS.

The United States commissioner to the Paris Exposition and his assistants have manifested especial interest in the maritime and naval exhibit of the nation at the exposition, and judging from present indications it will be a most creditable one. A feature of the merchant marine exhibit will be the yachting section. Models of all the cup defenders and the other principal yachts owned in this country will be shown. Then there will be models of all the distinctive craft to be found in American waters, including ferry boats, car floats, ice breaking steamers, whale-backs and cable ships. The largest single exhibit will be that of the American line, which will include models of their steamers. The marine engineering department will be placed in the civil engineering and transportation building.

In the government display will be an extensive exhibit of engineering work on the Mississippi river and this will include an elaborate representation of river steamers. Lumber rafts, tow boats, barges, pile drivers and other unique Mississippi river craft will be shown in detail by means of models, drawings and photographs. Of the large model of the Chicago drainage canal, which is to be exhibited, the Review had something to say in previous issues. The model will depict the entire length of the canal, showing the methods of excavation, dredging, etc., as well as the bridges which span the canal. In view of the fact that there will be no army exhibit by our government, almost all the space will be devoted to the navy. A prominent feature will be a large collection of models showing all the more important war vessels in the American fleet. The weather bureau, which, by the way, has the reputation of being the best in the world, will make a very creditable exhibit, consisting primarily of all the instruments employed and illustrating the methods followed in observational work.

PLEASED WITH AMERICAN METHODS

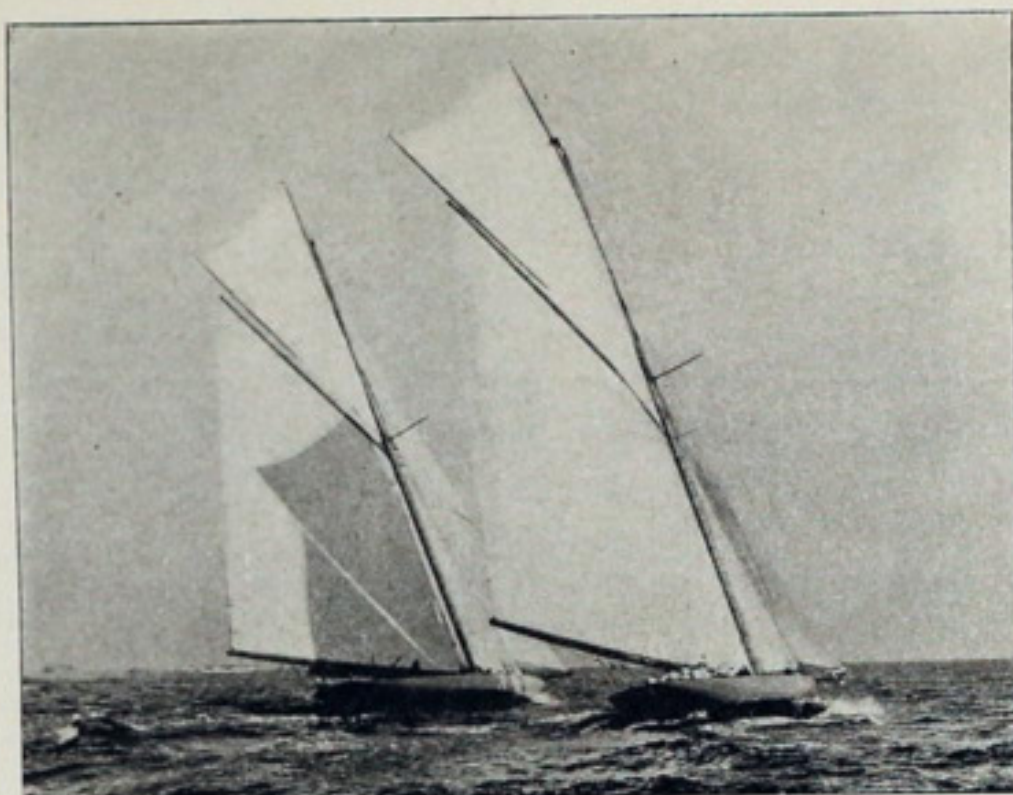
Another British visitor has just paid a tribute to American ship building methods. Some months ago the London Times sent G. R. Dunell, well known in engineering circles throughout England, to this country to study industrial development. On the eve of his return home he gave out an interview in which he referred most highly to the machinery equipment and administrative methods followed in America's manufacturing establishments. In the course of his remarks Mr. Dunell said: "Something else of more vital, practical importance has now attained a stupendous development. That is the art of ship building. The Chicago and Cleveland yards offer an opportunity for acquiring a fund of knowledge in this respect. I think the practice of launching a ship sideways is more logical than the prevailing English system, and for these reasons: You haven't got the same length of launching ways as by our method of launching lengthways. Then there is not the same stress put on the structure by being water borne at the after part before the forward part has left the ways. You can have a permanent steel staying in place of ordinary scaffolding, which facilitates the handling of tools. I think the uses which pneumatic tools, especially riveters, are put to in the American yards are simply marvelous. The rapidity with which the construction of a ship is conducted is bewildering."

Vessel men of New Orleans and vicinity are naturally enthusiastic over the transfer to that district of Light-House Inspector James R. Selfridge, while the maritime interests of Boston, where Commander Selfridge has been stationed, are correspondingly regretful because of the change. The transfer was not made at the request of Inspector Selfridge but the southern post was offered to him when members of the light-house board learned that his wife's health necessitated a change of climate. Commander Selfridge inaugurated many improvements at Boston, not the least of which was the practice of keeping tenders continually under steam, so that when a buoy was reported adrift there was little delay in reaching it.

The British admiralty has continued its chartering of vessels to convey troops to South Africa until the total is now 164, aggregating 779,000 tons burden. Of these 135 steamers, of 707,166 gross tons, are over 3,000 tons each and six of them are over 9,000 tons each. Germany is the only country that could under similar circumstances charter such a quantity of native-owned large-tonnage vessels and then only by absorbing three-fourths of its vessels of over 3,000 tons burden. There are 1,242 steamers of 3,000 tons on the British register, making an aggregate of 5,247,703 tons. Thus the total tonnage at present under charter amounts to only 13 per cent of the classes of vessels dealt with.

In line with a recommendation contained in the report of the secretary of the navy, Representative Bingham has introduced a bill in the house authorizing the secretary of the navy to change the material to be used in the construction of the dry dock at League Island, Pa., from timber to stone and concrete. The cost of the new dry dock is fixed at \$1,100,000.

Vessel men will be disappointed to hear that President Frank J. Firth of the Lake Carriers' Association will be unable to attend the annual meeting in Detroit next month. It was expected that the meeting would prove highly interesting, on account of Mr. Firth's ability as a presiding officer. Mr. Firth will sail for England on the 13th inst., expecting to be absent all winter.



COLUMBIA AND SHAMROCK CROSSING THE LINE.



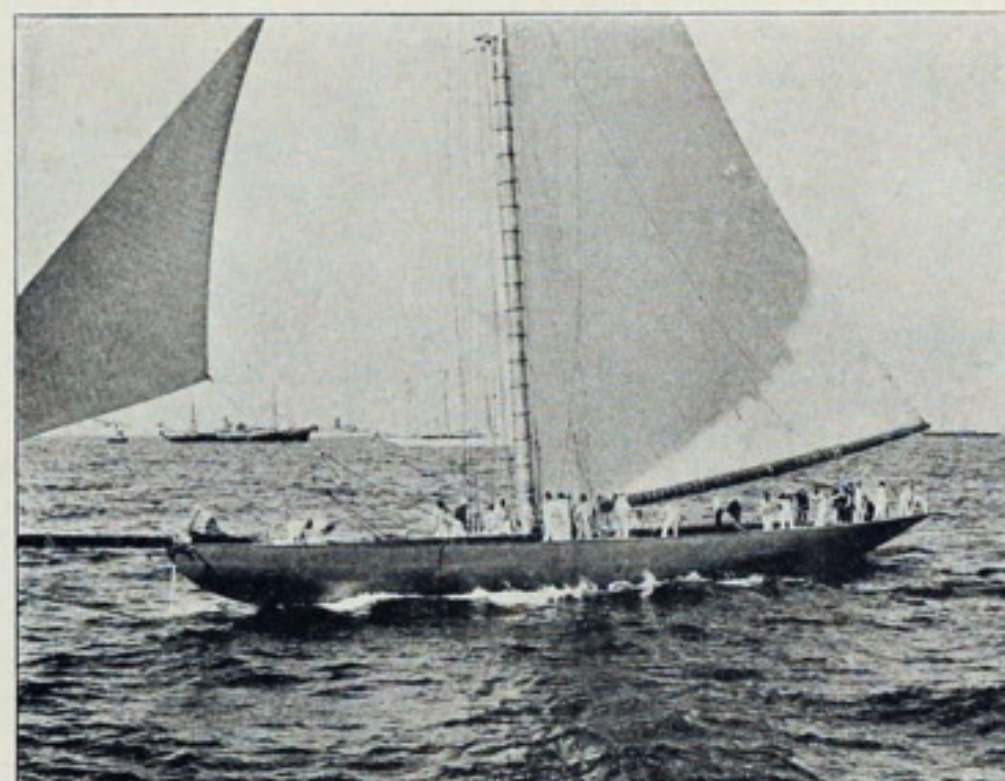
SHAMROCK AND COLUMBIA MANEUVERING FOR START.



COLUMBIA CROSSING LINE--SHAMROCK ASTERN.



SHAMROCK CROSSING THE LINE.



SHAMROCK SHIPPING SPINNAKER BOOM.



COLUMBIA COMING FOR THE LINE.

SUPPLEMENT TO THE MARINE REVIEW, CLEVELAND, VOL. XX No. 23, DEC. 7, 1899.

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SNAP SHOTS OF THE 1899 YACHTING CONTEST FOR THE AMERICA CUP.

VIEWS OF THE PRESIDENT.

NO DOUBT OF HIS POSITION REGARDING SHIPPING LEGISLATION—EXTRACT ON THIS SUBJECT FROM HIS MESSAGE—THE BILL IN CONGRESS—COMMUNICATIONS FROM HARVEY D. GOULDER AND PRESIDENT SEARCH OF THE AMERICAN ASSOCIATION OF MANUFACTURERS.

Questions Submitted by the Marine Review.

1. Shall the United States continue to allow its merchant marine in foreign trade to fight a losing battle until it entirely passes out of existence and foreign nations absorb the ocean carrying of our entire import and export trade?

2. Shall the United States decide, as its permanent non-partisan public policy, that an equitable share of its imports and exports must be carried on vessels of the United States, built in our own ship yards and flying our own flag, and that congress will enact whatever national legislation may be needed to stimulate and encourage our citizens to create, maintain and operate the vessels this policy calls for?

3. If it is recommended that congress shall enact remedial legislation, what shall it be, and why?

PRESIDENT MCKINLEY'S RECOMMENDATIONS.

The value of an American merchant marine to the extension of our commercial trade and the strengthening of our power upon the sea invites the immediate action of congress. Our national development will be one-sided and unsatisfactory so long as the remarkable growth of our inland industries remains unaccompanied by progress on the seas. There is no lack of constitutional authority for legislation which shall give to the country maritime strength commensurate with its industrial achievements and with its rank among the nations of the earth. The past year has recorded exceptional activity in our ship yards and the promises of continual prosperity in ship building are abundant. Advanced legislation for the protection of our seamen has been enacted. Our coast trade, under regulations wisely framed at the beginning of the government and since, shows results for the past fiscal year unequaled in our records or those of any other power. We shall fail to realize our opportunities, however, if we complacently regard only matters at home and blind ourselves to the necessity of securing our share in the valuable carrying trade of the world.

Last year American vessels transported a smaller share of our exports and imports than during any former year in all our history, and the measure of our dependence upon foreign shipping was painfully manifested to our people. Without any choice of our own, but from necessity, the departments of the government, charged with military and naval operations in the east and west Indies, had to obtain from foreign flags merchant vessels essential for those operations. The other great nations have not hesitated to adopt the required means to develop their shipping as a factor in national defence and as one of the surest and speediest means of obtaining for their producers a share in foreign markets. Like vigilance and effort on our part cannot fail to improve our situation, which is regarded with humiliation at home and with surprise abroad. Even these sacrifices, which at the beginning may be involved, will be offset later by more than equivalent gains. The expense is as nothing compared to the advantage to be achieved. The re-establishment of our merchant marine involves, in a large measure, our continued industrial progress and the extension of our commercial triumphs. I am satisfied the judgment of the country favors the policy of aid to our merchant marine, which will broaden our commerce and markets and upbuild our sea carrying capacity for the products of agriculture and manufacture; which, with the increase of our navy, mean more work and wages to our countrymen, as well as a safeguard to American interests in every part of the world.—From message to Fifty-sixth congress.

One of the first measures introduced in the Fifty-Sixth congress was the shipping bill, which is the same in all essential particulars as the Hanna-Payne bill of the last congress, except that the new measure contains a provision that the bounties shall not exceed \$9,000,000 annually, and that foreign-built ships having American registry, shall have only 50 per cent of the bounty rates provided. In case the total bounties earned exceeded \$9,000,000, a pro rata allowance is to be made. There is every prospect that this measure will be passed. A new force in its favor is the influence of the Sailors' Union, now in national convention in Chicago, and which will probably adopt resolutions in favor of the measure. The boiler makers and metal workers employed in the ship yards will also endeavor, at the convention of federated unions of their kind, which will be held in Detroit shortly, to secure endorsement of the bill.

FROM HARVEY D. GOULDER, COUNSEL OF THE LAKE CARRIERS' ASSOCIATION.

Editor Marine Review: Replying to your inquiries on the subject of our foreign merchant marine:

That the people of the United States should have, for so long time, tolerated a policy which has permitted the steady decadence of our foreign merchant marine is surprising. Not so much, perhaps, when it is considered that but comparatively few have given the subject any thought,

the great body of the people, and not a few in official station, regarding it, if at all, as a matter of concern to only such as seek that investment for individual gain. Others regard it as a mere matter of sentiment, desirable, but of no particular consequence except as a matter of national pride.

The persistent endeavors of a few to bring the people to a realizing sense of the magnitude of our foreign trade, and the pitiable inadequacy of American bottoms to care for it; the manifest possibilities of development, and a growing feeling of belittlement that a giant nation should be content with a pygmy's portion of its own carrying trade; the creation of new interest in foreign affairs and trade by the achievements of the navy, have all tended to awaken the public sense, and, let us hope, arouse the people to the determination that the decadence of the merchant marine shall cease, and some policy formed and followed which shall bring about such development of our merchant marine as will enable the major part of our foreign trade to be carried in American bottoms.

It fires our hearts to speak or hear others speak of the successes of the navy, the evidence of our development as a sea power, but if there is nothing to follow but the boast of victory, our position as a nation will be very like that of a vaunting bully. Whatever we ought to have done (in an abstract sense), the fact is that we have been drawn into definite interests in world affairs outside our ancient boundaries.

We have the material resources and present opportunity to supply to the full measure of one nation's share, the markets of commercial nations. It has never been successfully argued that this can be well or adequately done in hired ships. A nation seeking this commercial advantage, can not secure it with ships flying a flag foreign to itself. There is something more than a mere sophism in the expression, "Trade follows the flag." This is not the occasion to argue out such proposition, but my settled conviction is that the lasting value of naval victories lies in the respect accorded the flag as an emblem of power and resource. Flying over a ship engaged in peaceful trade, the flag and ship and all their concerns command attention and respect. If experience shall show that the goods she carries are entitled to the like attention and respect, her full share of the market is at her command. American goods reaching foreign markets in ships flying the American flag, is the best basis of trade extension. It will bring the greatest advantage to the purchasers, the manufacturers and merchants of America, an advantage in which the whole people fully share. I would put this above the direct advantage in the earning of freights by our own citizens, the increase of ship building and cognate industries.

We can see what lake commerce has done for the lake cities. The prosperity of the ship building plants; the enormous sums they have paid and are paying to an army of employes and for materials fabricated by another army of men; the employment of large numbers of officers and seamen in navigating the vessels, furnish an object lesson plain enough for any understanding. The direct benefit in building, supplying and manning our own ships, and the earning of freights are sufficient to justify much effort and any reasonable expense. The indirect benefits, deeper and more widespread, which would come to the whole people as a nation, are such as, in my opinion, make the question of expense incurred to bring this about a matter of secondary consideration.

To your first question, therefore, my answer is "No"; to the second, "Yes, it is one of the most important subjects congress has to consider."

Third. From a careful study of the Hanna-Payne bill, I believe its enactment would cover the ground intelligently and well. It may be argued that aid is not necessary; that in time our foreign marine will develop. If this be true, surely it can do no harm to hasten it somewhat. It has not, however, been developing, but if it shall have help over the hard place it is now in, it will be in the better condition to profit from all natural means as they shall come.

Cleveland, Dec. 1, 1899.

H. D. GOULDER.

A LIFE-GIVING FORCE TO AMERICAN SHIPPING SAYS MR. THEO. C. SEARCH, PRESIDENT OF THE AMERICAN ASSOCIATION OF MANUFACTURERS.

Editor Marine Review:—The ocean shipping question is one that has engaged the attention of Americans for many years. The facts about it are familiar to all men who read and think. That the American ship is rarely or never seen in foreign ports is common knowledge. That we once hauled nearly all our imports and exports, but now convey less than 10 per cent in American bottoms is notorious. That we are among Lord Salisbury's "dying nations" in the shipping business there is nobody to gainsay. We lost the high position enjoyed by us as ship builders and navigators when the wooden ship went out of style and the iron ship from England came in to take its place. We have been going down hill ever since, and, although some fine yards have been developed to build vessels for the lake and coasting trade and battleships and cruisers for the "new navy," the merchant steamer for the ocean carrying trade is constructed oversea, is owned oversea and comes to our shores under a foreign flag to earn money for its foreign proprietors. Here is a business that would be as profitable for Americans as for Englishmen or Germans. It would employ great bodies of our people, put life and impulse into many native industries and be a permanent source of income to hundreds of thousands of our countrymen.

It is admitted that the hour is now at hand when something must be done. Further argument is needless. Knowing what to do the next thing is to do it, and the remedies are in full view. They are to be found in the experience of other governments. New or original schemes need not be sought for and congress will find its task well mapped out for it. There are only two propositions of first-rate importance and these are (1) for subventions, that is annual lump payments to shipping lines, and (2) for bounties or premiums to be paid by the government according to tonnage or the distance sailed. The discriminating duty on imports in other than American bottoms, which was recommended rather urgently a few years ago as a means of rehabilitating the merchant marine of the United States, has now gone into discredit. As a possible policy it is not likely that it will soon be resurrected. If the government desires to encourage its shipping industry it must do so by those methods which have been employed and have been found to be effective in other countries.

Direct payments of either class, the subvention or the bounty, find abundant justification in the fact that the government receives value from the ships in postal service and in the national defence, inasmuch as the vessels may be converted at short notice into naval auxiliaries or military transports. A well thought out and carefully framed bill providing for bounties for American ships was before congress at its last session and will again claim the attention of that body when it meets in December. The way was prepared for this measure by a law which congress passed in 1891 and which has already borne good fruit. The new shipping law will extend that principle. It is a further adoption and application of methods successfully tested abroad. It is designed to hasten a good movement. It only needs now the earnest support of the American people in the south and the north, and the west and the east, to put it on the statute books where it will be a life-giving force to American shipping. Public sentiment should mass itself behind this bill in a volume and with a power that will overcome all opposition.

It is not the ship builders alone who will derive advantages from such legislation. There is capital which is always alert for profitable investment. There are steel, machinery and material to be bought from American manufacturers. There are wages for great numbers of mechanics and seamen. It has been truly said that if the government adopts this new policy in regard to ships the demand for material for new vessels will be so great as to guarantee activity in the iron and steel trades, already so busy and prosperous, for a long time to come. Such a feeling of security in respect of one of the most important of our industries will confer direct or indirect benefit upon all classes of the population.

The manufacturers and indeed the whole great business element in this country have another interest in the upbuilding of the merchant marine. They are concerned respecting the American foreign trade. They desire that there shall be facilities for the direct shipment of goods to all the important markets. They believe that this service will be better for Americans if it is organized by Americans. The ships should be American ships flying the American flag. It is only through a strong merchant marine of our own that we need expect to have a maximum of efficiency with frequent sailings over direct routes at cheap rates. The country which has its own ships will have agencies of transportation whose first business it will be to serve its own people at its own ports. American ships would aim first to secure American trade. They might scatter into other parts of the world seeking business wherever they could find it in future years, as the British ship has done, but their foremost task would be to carry away our own exports and bring hither our own imports, and this is a condition of things which would soon be reflected in the freight markets to the advantage of all our industries.

In no country have more remarkable advances been made in a few years than in Germany. No great modern people, with exceptions for the Russians and the Austrians, might be supposed to be less well adapted for life upon the sea. Their only practicable outlet to the ocean was from one or two hundred miles of coast on the North Sea, and a considerable part of this shore belonged to Denmark up to a rather recent date. There were some German harbors on the Baltic Sea, but boats from these ports, except those engaged in trade with Russia and Scandinavia, had to pass the Danish and Swedish forts through a narrow passage way, until the completion a few years ago of the Kiel canal. German shipping interests had to place their main reliance on Hamburg and Bremen, ports located a considerable distance up rivers, whose importance as centers for the ocean trade dated from a time when vessels drew much less water than they do today. The German was not by nature a seaman. He had no innate talent either for building or navigating a ship, and it is only after a consideration of all these facts that any fair idea can be secured of the importance of the developments of the past few years. The harbor works at Hamburg and Bremen, the canal to connect the Baltic and North Seas, enormous busy ship yards, handsome, swift and commodious modern vessels, the equals of any afloat, and rich steamship lines which run into every ocean are some of the results we see today in Germany.

All this has not been attained by accident. The movement has been well directed by men of serious purpose. Government and private capital have worked hand in hand. There has been hearty co-operation and the progress has been marvelous. Many of the lines have received subventions. The German line to the Far East, openly established with the object of building up German trade in China, Japan and Australia, is one of the most notable and successful instances of this kind. The aid which the government has extended to shipping in Germany, however, is of still another character. The state owns the railways and shippers are often given special export rates. In this way the government, without appearing to favor the shipping interests, does them nevertheless a very useful service. By such a policy, well-regulated and continued throughout a period of years, aided by their excellent technical schools for ship builders and navigators, the Germans have raised themselves from a tribe of landmen to one of the foremost commercial nations in the world.

While the Germans had few natural qualities fitting them to follow the sea, the Americans are of a different type. They inherited the traditions of the English people as navigators. The Yankee sailing ship, shaped out of the timber hewn from the forests of New England, and the Yankee sailor were long a sight on every wave. The United States has thousands of miles of coast line on the Atlantic, as well as the Pacific Ocean. No country is more favorably situated in respect of water front. It has harbors in abundance, the peers of any in the world. One coast invites trade with Europe, Africa and South America; the other with Australia and Asia. The country has unlimited natural resources which have led to the upbuilding of great industries. Nature decrees that we shall carry on commerce with other lands on a large scale. And yet despite all these favoring circumstances we have been going backward as a shipping nation for many years. We have allowed the American flag to be driven from the seas, the Yankee sailor has sought another occupation and has forgotten his craft, while our harbors swarm with shipping from other lands.

The condition of the industry is so unfortunate that an heroic remedy

is required. It is a desperate situation. Positive action is necessary at once. Because this important industry is in this plight, because the nation should have postal boats and boats upon which young sailors and apprentices may be trained, and because a strong merchant fleet is needed as a guaranty of national security in war time, the United States government must be enlisted in this work of building up a mercantile navy under the American flag which will be the pride of every citizen.

It is said that the ship building industry in this country now needs no subventions; that subventions would only be gratuities; that American ship yards were never more busy and that American steel makers have lately furnished large quantities of ship plates to Great Britain. If our ship yards are now quite busy an investigation will show that it is on coasting vessels and warships, and vessels to be navigated under the terms of the shipping law of 1891. If we can make ship plates for Europe we can make them for ourselves, but we must have steady employment for our ship yards on a large scale and a greater incentive for the investment of money in ships than the mere ability to build them cheaply. They must be operated after they are built. Consul Russell of Liverpool, recently computed that on American vessels crews can only be procured by paying them from 32 to 37 per cent more than on British vessels, while to feed and maintain seamen on American ships costs 27 per cent more than on British ships. Other expenses are heavier also, and although these will tend all the while to fall to European levels, the first steps are costly. A certain insurance to timid investors, differences in wages and operating expenses, the cost attendant upon general inexperience in the business, and the difficulty of establishing new enterprises, as well as the possible conspiracy of older rivals in the trade to keep newcomers off the routes by cutting down freight rates to ruinously low figures—all these items must be covered by the government in its bounty bill. That these disadvantages which we will at first be subjected to will gradually disappear admits of no question. As our position in the shipping trade becomes stronger smaller payments may suffice. The task now is to start this long delayed movement, and it is the immediate duty of every American to urge upon those who are responsible for the conduct of the government the adoption of an active and enlightened policy in respect of the American ship.

THEO. C. SEARCH.

Philadelphia, Nov. 28, 1899.

A NOTE OF EXPLANATION FROM MR. W. I. BABCOCK.

In the Review of last week it was said that the "free ship" publications of the country were doing Mr. W. I. Babcock of the Chicago Ship Building Co. an injustice in quoting him as saying that even now the ship builders of the United States can build at as low cost as foreign builders. That Mr. Babcock's communication on this score was misunderstood will be seen by the following note, just received from him:

"Having found that in some quarters my letter to you of Oct. 14, 1899, has been misunderstood in one respect and taken to mean that I consider that even now the ship builders of this country can build at as low a cost as foreign builders, I beg to be allowed to correct that impression, which was not intended nor is it a fair inference from what I did say. At the present time the very much higher wages paid by us, nearly double the average rate in British yards, makes a difference against us in labor cost too large to be overcome, either by the admitted greater efficiency and willingness of our mechanics, our much greater freedom from tyranny of trades unions, or our more extended use of labor-saving machinery. When, however, the increasing volume of orders and certainty of their permanency, following wise legislation by congress, calls into existence here new yards, modern in every respect, and justifies the remodelling and improvement of existing plants; in other words, when, as I said before, we have plenty of work and time to get ready, then we can beat the world."

TRIPLE SCREWS THIRTEEN YEARS AGO.

A new claimant has appeared for the honor of discovery of the value of triple screws in war ships. The chief constructor of the Russian navy says that during the trials of the *Livadia*, Dr. A. C. Kirk made a model and had it carefully tested on Loch Lomond at the instigation of Capt. Artsayooloof, to determine the efficiency of twin propellers, with and without the center propeller in position, and with all three propellers in use. During all the thirteen years which have intervened since their submission the reports made by Dr. Kirk have remained in the archives at St. Petersburg. They are now to be given out and it is claimed that they will show that Dr. Kirk, by his experiments, arrived at conclusions which have since been proven in practice to be accurate. Dr. Kirk found that up to 15 knots the result, so far as propulsive efficiency was concerned, was the same whether the total power was divided between two or three screws, but that for higher speeds it was possible that the division of the power among three screws would be advantageous, although the data was not conclusive. The dragging of the center screw due to working only the two side screws increased the power required for 13 knots speed by 11 per cent. The conclusions deduced from his experiments, as embodied in the report to the Russian government, were that the division of power between three screws was at any rate perfectly safe; that the steering would be improved by the third screw, and that at very low cruising speeds the third engine would be an admirable thing.

SUPPLEMENT TO THIS ISSUE.

We have reproduced as a supplement to this issue half a dozen copies of photographs taken by the Detroit Photographic Co. during the last International cup races between the *Shamrock* and *Columbia*. These views are part of an historical collection of views made by that company, which is by all odds the finest yacht collection in existence. In addition to making a specialty of photographing all the races and cruises of the various yacht clubs, this company has the largest collection of individual yacht photographs in the country. It is interesting to note that they have lately taken up great lakes subjects, and are engaged on making a complete series of shipping scenes on the lakes, in which much interesting material is sure to be gathered.

THE TORPEDO BOAT DAHLGREN.

It is to be regretted that the speed performance of the United States torpedo boat Dahlgren has been marred by malicious and untruthful statements published by a New York daily paper and which have since been copied by many papers throughout the country. Somebody's spite was quite apparent in every sentence of the article that attacked the Dahlgren and her builders, the Bath Iron Works. It was a jumble of direct falsehoods and facts so misconstrued and perverted as to amount to the same thing as direct falsehoods. The official report of the trial board of the Dahlgren is one of the most favorable and flattering that has ever been prepared. The vessel made her required speed on her first official test and that under the most unfavorable conditions. The official trials of the Dahlgren have been accurately reported in the Marine Review and to dwell upon the trial results would be merely a repetition of what has already been published. The fact that the Dahlgren put into Portsmouth, N. H., after her official test at sea and that she remained there two days waiting for the sea and weather to moderate before returning to Bath is convincing proof that the speed trial was made under most unfavorable conditions. The vessel and her machinery cannot have been strained by speed tests, for there has been no breakdown of any description on board the vessel, the splitting of a boiler tube being the only accident worth recording, and that was, of course, insignificant. The hull is perfect and not a rivet has been found defective, the vibrations being practically nil. The builders have no intention of appealing to congress to have any fines or penalties remitted.

The contract of the Dahlgren was as tight and as strict as that of any government vessel contracted for within recent years. The vessel was not completed on time, but it is well to note that no torpedo vessel built in this country has as yet been finished within the contract time. The last lot of twelve torpedo boats contracted for were due to be delivered six weeks ago and not one of them will be ready for trial within a year.

The Dahlgren was designed for a speed of 30 knots. The department advertisement under which bids for the Dahlgren and Craven were submitted, called for a speed of 30 knots, the contract being carried out for this speed, but a supplementary agreement, proposed by the Bath Iron Works, was made for an additional one-half knot speed, the price for the vessel and her machinery being \$194,000 if the speed exceeded 30½ knots, and \$189,000 if the speed was between 30 knots and 30½ knots; the usual penalties to be enforced if the speed of the vessel fell below 30 knots. This high speed was to be maintained for one hour, the trial to be of whatever type the department chose to dictate.

Now as to the final paragraphs, relative to the trial, in this malicious article: The Dahlgren used Pocahontas and Kentucky cannel coal because the builders considered this mixture as good as any other. It is not used in the navy because it is too expensive, but the quality of coal has little bearing on the speed of the boat. It is ridiculous to say that the Dahlgren can make only 25 knots per hour with "ordinary Pocahontas coal," for she has often made 29 to 30 knots on her preliminary runs with the cheapest and most inferior kind of coal. The builders of naval vessels though would even have all the latitude they desire in the choice of fuels. In France, briquettes, which are compressed, clean, washed coal, rosin and tar, are always used. The T. A. M. Craven, sister to the Dahlgren, on Nov. 27, with ordinary cheap coal, attained the phenomenal speed of 31.04 knots on her second full-speed preliminary speed test. There was no short spurt about the trial of the Dahlgren, for the steam pressure and revolutions were constantly increasing for the 1¾ hours that the vessel was under way. When the trial ended the vessel was traveling in a heavy sea at a 30.8-knot gait, a truly remarkable rate of speed. As dense smoke and flame shooting from the stack are due to fuel, air pressure and thickness of fire, this feature, when desired, can be easily remedied and moreover experiments made at Bath clearly show that all such disagreeable features can be eliminated without a reduction in speed. The Craven made 31 knots without any flame being visible and only a slight haze proceeding from the stack. Moreover the amount of smoke and flame emitted does not increase with the speed of the boat, but is all due to the fire room conditions.

In conclusion it may be said that the Dahlgren's steam performance is the most remarkable in the annals of American ship building. Designed and built by a firm inexperienced in torpedo boat construction, she has obtained greater speed, more I. H. P. per square foot of grate and per ton weight of machinery than any torpedo boat afloat except the Normand-built boats Forban and Cyclone of the French navy. This phenomenal performance was obtained under most unfavorable conditions by an inexperienced crew composed of Bath Iron Works machinists and boiler makers, not one of whom had ever stepped onto a torpedo boat before. The machinery cannot be said to have been forced, for the piston speed only reached 1,100 feet per minute and the trials, preliminary and final, were conducted without an accident or break down of any description, beyond the discovering of a defective boiler tube. The T. A. M. Craven will be the Bath Iron Works reply to the criticism of the Dahlgren, but this vessel will be much handicapped by having her official speed tests in boisterous winter months. It is more than probable that the Dahlgren and Craven, if speeded and forced to the utmost by an expert trial crew, such as Mons. Normand employs, would, under favorable conditions, prove to be 31½ to 32-knot boats.

Secretary Long has replied to the criticism on the Dahlgren by saying that she is an exceedingly fast vessel, her performance being beyond contract requirements, and a good deal above acceptance requirements, and the trial board, after reporting most favorably on the Dahlgren, are indignant at the reports which have been circulated throughout the country, for such malicious, unjust accusations reflect on them as well as on the builders.

FACTS.

Mr. H. C. Frick has given up the duties of chairman of the board of managers of the Carnegie Steel Co., Ltd., joining Messrs. Carnegie, Phipps and Singer as consulting partners of the company. The position of chairman of the board will be abolished. Mr. H. M. Curry, who has been ill for a long time, also resigned membership in the board. Geo. Lauder and A. M. Moreland will fill the vacancies.

UNITED STATES LIFE SAVING SERVICE.

WASHINGTON BUREAU, MARINE REVIEW, 1345 PENNSYLVANIA AVENUE, WASHINGTON, D. C., DECEMBER 6, 1899.

From the annual report of Supt. Kimball of the United States life saving service, it is learned that at the close of the last fiscal year (June 30, 1899) the establishment embraced 265 stations, 193 being on the Atlantic and Gulf coasts, fifty-six on the great lakes, fifteen on the Pacific, and one at the Falls of the Ohio, Louisville, Ky. The number of disasters to documented vessels within the field of the operations of the service during the year was 428. There were on board these vessels 3,903 persons, of whom 3,847 were saved and fifty-six lost. The estimated value of the vessels involved was \$6,072,635, and that of their cargoes \$2,032,005, making the total value of property imperiled \$8,104,640. Of this amount \$6,261,900 was saved, and \$1,842,740 lost; not by the life savers, of course, as the report deals generally with what happened within the scope of the service. Seven hundred and fifty-one shipwrecked persons received succor at the stations, to whom 1,460 days' relief in the aggregate was afforded. The number of vessels totally lost was seventy-two. In addition to the foregoing, there were during the year 294 casualties to small craft, such as small yachts, sailboats, rowboats, etc., on board of which there were 671 persons, 664 of whom were saved, and seven lost. The property involved in these instances is estimated at \$138,535, of which \$129,285 was saved, and \$9,250 lost.

The result of all disasters within the scope of the service are in the aggregate, therefore, as follows: Total number of disasters, 722; value of property involved, \$8,243,175; property saved, \$6,391,185; property lost, \$1,851,990; persons involved, 4,574; persons lost, 63; shipwrecked persons succored at stations, 751; days' succor afforded, 1,460; vessels totally lost, 72.

Of the sixty-three persons who perished, forty-four were lost in one district, the second, coast of Massachusetts, and forty of these in one storm, the almost unprecedented tempest of Nov. 26 and 27, 1898. One-half of this latter number were on board of vessels which were destroyed on outlying rocks and shoals, where they could not be seen. The entire loss of life in all the other districts was only nineteen. These, with the four lost in the second district, aside from those who perished in the November hurricane, make a total loss of twenty-three, which number falls considerably below the average annual loss of all the districts in recent years. Besides the number of persons saved from vessels of all kinds there were seventy-two others rescued who had fallen from wharves, piers, etc., the most of whom would have perished but for the aid of the life-saving crews. The crews saved, and assisted in saving during the year, 387 vessels, valued, with their cargoes, at \$2,968,255, and rendered assistance of minor importance to 382 other vessels in distress, besides warning from danger by the signals of patrolmen, 193 vessels. The number of lives and amount of property saved through these warnings is, of course, undeterminable. It is certain that numerous disasters were thereby averted, but the loss of life and property prevented can never be known.

A station located at Peterson's Point, State of Washington, which was completed but not manned at the close of the year 1898, has been placed in commission. One at Great Boar's Head, New Hampshire, and one at Sandy Point, Rhode Island, which were in process of construction when the report for 1898 was made, have been completed and manned. A new station on Hog Island, Va., has been completed, as have also the stations reported in 1898 as being rebuilt at Mantoloking, Island beach, Ship Bottom, Little Egg, Brigantine, Pecks beach, Corson Inlet and Holly beach, New Jersey; and also one at Toms River, New Jersey, which age and inadaptation to the needs of the service had made unsuitable for further use. A new station was begun at Point Bonita, California, but was not completed.

ENFORCE THE RULES.

VESSEL OWNERS INSIST THAT AN EXAMPLE MUST BE MADE OF THE SHIP MASTER WHO CAUSES A DISASTER LIKE THAT OF THE PAST WEEK IN THE ST. MARY'S RIVER.

Half a million dollars, at a very low estimate, would not cover the loss to shipping on the great lakes that has resulted from two accidents occurring recently to vessels of the Rockefeller fleet in the St. Mary's river. The sinking of the steamer Houghton, a few weeks ago, by a blow from the barge which she had in tow, was a very disastrous affair, but whether due to the breaking of wheel chains or not, there was no negligence connected with it or fault to be charged against the vessels. The disaster of the past week, however, is another matter. This blockade of 150 or more big ships in the closing hours of the season, with freights at highly profitable figures, and when every minute counted with the whole lake fleet, was due to the worst kind of carelessness on the part of the captain of the Northern line steamer North Star and probably also—but not in the same degree—on the part of the captain of the Rockefeller steamer Siemens. It is not within the province of the Marine Review or publications of its kind to keep harping at government officials on the score of their duty regarding the enforcement of steamboat rules, but the importance of this case and the evident violation of law is so plain, that it may be said for the entire vessel interests of the lakes that they are looking for an immediate investigation and the enforcement of the full measure of penalty from the bureaus of the treasury department that have to do with the navigation of the St. Mary's river and the licensing of vessel masters. The cause of the accident is plain to every captain on the lakes. It is admitted that racing has occurred repeatedly in the short stretch of channel between the Sault canal and the crib light at the head of Little Rapids cut, where the absolute rule against one vessel passing another while going in the same direction does not apply. In this short reach the North Star attempted to pass the Rockefeller tow but did not succeed in doing so and when the vessels—all in a bunch—entered the narrow cut just below the light, they were thrown together so that there was no

possibility of controlling them. To have waited until there would have been plenty of room to pass farther down the river would not have made five minutes difference in the time of the North Star. This is the aggravating feature of all such accidents. It is true, of course, that the captain of the Siemens had the right of way, and from all reports of the disaster there is no evidence of fault as to rules on his part, but it may be said of him that if he found a madman following in his path and could avoid him by checking pace and getting under cover he should do so, no matter what right he might have by law to the roadway.

Capt. Thomas H. Sanders of the steamer Hackett passed down from the canal just ahead of the Siemens and North Star. He says that upon

feet of her length ahead of the Siemens. Then the steamers became unmanageable and all kinds of whistles were blown, like a launch in a ship yard, Capt. Sanders said. Soon the vessels were wedged in the channel banks.

It is understood that Capt. Davis of the Sault river patrol, which is conducted by the United States revenue cutter service, has reported the captain of the North Star for gross violation of the river rules.

Newspaper correspondents are speculating on the objects of the Cramp Marine Improvement Co. of Philadelphia, recently incorporated in New Jersey with a nominal capital of \$100,000. One report is to the



SECOND BLOCKADE OF LAKE CARRIERS IN THE ST. MARY'S RIVER.

Upper view—Waiting fleet at the Sault on Thanksgiving day. Middle view—Looking northwest, directly up the channel; Siemens across the channel and North Star shoved over to the north. Lower view—Looking north across the channel, showing tugs to the left pulling on the stranded Siemens and dredge to the right trying to dig her out of the bank on the lower side.

turning at the light he heard two whistles from the North Star twice, and both times they were answered by danger signals from the Siemens. When the North Star first blew two whistles she was abreast of the barge which the Siemens was towing. She forged ahead, and when her second signal of two whistles was answered by a danger signal from the Siemens, Capt. Sanders was satisfied there was trouble in sight and he kept watch of the vessels. When rounding the crib light the North Star was probably 150

feet of her length ahead of the Siemens. Then the steamers became unmanageable and all kinds of whistles were blown, like a launch in a ship yard, Capt. Sanders said. Soon the vessels were wedged in the channel banks.

effect that the new corporation has for its object the development of a vast territory in the vicinity of the eastern terminus of the trans-Siberian railway and the construction of docking and shipping facilities at the terminus of the road at Vladivostock. The principal office of the new company is in the New Jersey Corporation Guarantee & Trust Co. building, Camden, N. J. The incorporators are Edwin F. Glenn, Joseph Gilfillan, Richard C. Ellis, Robert J. McKinstrey and George S. Graham.

AVERAGE LAKE FREIGHTS.

FIGURES RULING FROM DAY TO DAY DURING 1899 PROVE IN MOST CASES MORE THAN DOUBLE THOSE OF 1898, AND STILL GREATER WHEN COMPARED WITH 1897, WHICH WAS THE POOREST YEAR OF ALL.

With insurance at an end on the great lakes, the special rates to be paid on a few cargoes that are to be moved under short extensions of policies, or without insurance of any kind, are not of importance in summarizing averages of daily freight rates for the season just closed. On account of the great extent of the ore traffic, compared with other branches of the lake trade, one item in this matter of freights that is of special importance is the average rate at which all iron ore was moved from the head of Lake Superior; not the average of daily rates, but the tonnage average, which represents both wild and contract ore, and which is secured through reports from all the ore shippers regarding their tons moved and their several averages. It is too early as yet to secure this figure, as reports have not been prepared by the ore companies, but the average daily rates on ore, coal and grain, not only for this year but for a great number of years past, have been made up from records kept by the Marine Review. These averages as regards iron ore are, of course, far above the tonnage average above referred to, on account of the great bulk of the ore having been moved on contracts made last winter and based on 60 cents a ton from the head of Lake Superior. It is needless to say that the average of daily rates for 1899 is very much in excess of 1898—in most cases more than double—and if compared with 1897, a still poorer year, the difference is even greater. The average daily rate on ore per gross ton from the head of Lake Superior, for instance, is \$1.29½ for the season just closed, against 57.2 cents in 1897; ore from Marquette, \$1.08½ in 1899, against 54.6 cents in 1897; ore from Escanaba, 94.8 cents in 1899, against 45.3 cents in 1897; wheat from Chicago to Buffalo, 2.7 cents per bushel in 1899, against 1.5 cents in 1897. It may be well to note that the averages given for five years past on wheat from Duluth to Buffalo represent the full season. For a period of about eighty days in the fall when Duluth grain shipments are most active the average would be much higher. Again let it be understood that the figures given in these summaries are not averages on quantities of freight. They are the averages of rates ruling from day to day throughout the season.

AVERAGE DAILY RATES OF FREIGHT ON THE GREAT LAKES, SEASON OF 1899.

	1899 Cents.	1898 Cents.
Iron ore, Escanaba to Ohio ports, gross ton.....	94.8	50.8
" " head of Lake Superior to Ohio ports, gross ton....	129.5	61.0
" " Marquette to Ohio ports, gross ton.....	108.5	59.8
Wheat, Chicago to Buffalo, bushel.....	2.7	1.5
" Duluth to Buffalo, bushel.....	3.6	1.8
Soft coal, Ohio ports to Milwaukee, net ton.....	68.9	27.8
" " Ohio ports to Duluth, net ton.....	45.4	23.4
" " Ohio ports to Portage, net ton.....	56.4	29.7
" " Ohio ports to Manitowoc, net ton.....	67.0	28.5
" " Ohio ports to Sheboygan, net ton.....	66.5	27.8
" " Ohio ports to Green Bay, net ton.....	66.5	28.5
" " Ohio ports to Escanaba, net ton.....	58.2	26.4
Hard coal, Buffalo to Milwaukee, net ton.....	72.7	28.0
" " Buffalo to Chicago, net ton.....	72.7	28.0
" " Buffalo to Duluth, net ton.....	49.5	23.0

AVERAGE DAILY FREIGHT RATES DURING TEN YEARS ENDING WITH 1899.

	Cents.
Iron ore, head of Lake Superior to Ohio ports, gross ton.....	94
" " Marquette to Ohio ports, gross ton.....	82
" " Escanaba to Ohio ports, gross ton.....	66½
Soft coal, Ohio ports to Milwaukee, net ton.....	49
" " Ohio ports to Duluth, net ton.....	38
Hard coal, Buffalo to Chicago, net ton.....	50
" " Buffalo to Duluth, net ton.....	31½
Wheat, Chicago to Buffalo, bushel.....	2

AVERAGE RATES ON WHEAT PER BUSHEL BY LAKE FROM CHICAGO TO BUFFALO.

Year.	Cents.	Year.	Cents.	Year.	Cents.
1859	5.08	1873	7.62	1887	4.13
1860	9.89	1874	4.03	1888	2.56
1861	11.53	1875	3.42	1889	2.51
1862	10.49	1876	2.90	1890	1.96
1863	7.51	1877	3.72	1891	2.38
1864	9.58	1878	3.07	1892	2.19
1865	9.78	1879	4.74	1893	1.66
1866	12.34	1880	5.76	1894	1.27
1867	6.67	1881	3.44	1895	1.97
1868	7.14	1882	2.50	1896	1.70
1869	6.81	1883	3.41	1897	1.56
1870	5.88	1884	2.18	1898	1.53
1871	7.62	1885	2.02	1899	2.71
1872	11.46	1886	3.68	Average 41 yrs.,	4.93

Charges to vessels for shoveling, trimming and tallying weights of grain amounted to \$3.98 per 1,000 bushels in 1899.

RANGE OF LAKE FREIGHT RATES ON WHEAT FROM DULUTH TO BUFFALO.

Year.	Rate, cents.	Year.	Rate, cents.
1899	3.6	1891	1¾@9½
1898	1.8	1890	2 @5
1897	1.75	1889	2 @5
1896	2.12	1888	2 @5
1895	3.50	1887	2 @8
1894	1¼@3	1886	3¼@8
1893	1¼@3½		
1892	2¼@4		

Figures for four years just past represent average of daily rates for full season; previous to 1895 the rates are highest and lowest of each season.

AVERAGE FREIGHT RATES ON IRON ORE PER GROSS TON, FROM PORTS NAMED TO OHIO PORTS—TABLE COVERING WILD AND CONTRACT RATES FOR TWENTY YEARS PAST.

YEAR.	ESCANABA.		MARQUETTE.		ASHLAND AND O HERPORTS AT THE HEAD OF LAKE SUPERIOR.	
	Wild or daily rate.	Contract rate.	Wild or daily rate.	Contract rate.	Wild or daily rate.	Contract rate.
1880	\$1 70	\$1 85	\$2 26	\$2 75	.....	.....
1881	1 36	1 75	2 05	2 45	.....	.....
1882	1 04	1 40	1 26	1 75	.....	.....
1883	1 22	1 00	1 40	1 20	.....	.....
1884	87	1 10	1 08	1 35	.....	.....
1885	78	90	98	1 05	\$1 25	\$1 15
1886	1 28	1 05	1 51	1 20	1 78	1 20
1887	1 59	1 40	1 87	1 63	2 23	2 00
1888	1 05	90	1 30	1 15	1 43	1 25
1889	1 01	1 00	1 19	1 10	1 34	1 25
1890	89	1 10	1 07	1 25	1 17	1 35
1891	84	65	1 02	90	1 11	1 00
1892	74	1 00	98	1 15	1 15	1 25
1893	56	85	71	1 00	77	1 00
1894	47	60	60	80	78	80
1895	73	55	92	75	1 13	80
1896	52	70	66	95	77	1 05
1897	45	45	55	65	57	70
1898	51	45	60	60	62	60
1899	95	50	1 08½	60	1 29½	60

Charge to vessel in 1899 for trimming and unloading, 19 cents a ton. Average ore rates for the entire period of twenty years: Escanaba, contract 96 cents, wild 92½ cents; Marquette, contract \$1.21, wild \$1.15½; Average for past ten years: Escanaba, contract 68½ cents, wild 66½ cents; Marquette, contract 86½ cents, wild 82 cents; Ashland and other ports at the head of Lake Superior, contract 91½ cents, wild 94 cents.

AVERAGES OF DAILY RATES ON SOFT COAL FROM OHIO PORTS TO CHICAGO, MILWAUKEE, ESCANABA, DULUTH, GREEN BAY AND MANITOWOC.

Year.	Milwaukee. Cents.	Escanaba. Cents.	Duluth Cents.	Green Bay. Cents.	Man'woc. Cents.
1890	64	45	49	....	....
1891	61	52	49	....	....
1892	58	43	43	55	49
1893	48	40	38	50	41
1894	48½	39	37½	49½	48
1895	54	39	36½	50	51
1896	33½	27	29½	32½	32
1897	28½	29½	26	30	31
1898	28	26½	23	28½	28½
1899	69	58	45½	66½	67
Average for ten years...	49	40	38	45	43½

Chicago rate about same as Milwaukee.

Coal of all kinds shipped in net tons and handled without charge to vessel.

AVERAGE OF DAILY LAKE FREIGHT RATES ON HARD COAL FROM BUFFALO TO CHICAGO, MILWAUKEE AND DULUTH DURING TEN YEARS PAST.

Year.	Chicago. Cents.	Duluth. Cents.
1890	62	43
1891	56	29
1892	59	43
1893	49	29
1894	46	25
1895	59	24
1896	36	24
1897	29	26
1898	28	23
1899	73	49½

Average for ten years..... 50 31½

Rate to Milwaukee practically the same as to Chicago.

Hard coal is net tons and is handled without charge to vessel.

In the regular monthly chart just issued by the weather bureau Alfred J. Henry has the following to say of December storms on the great lakes: "The first half of December, during which time navigation on the great lakes practically comes to an end, is a stormy period, yet not more so than at any other time during the winter season. The winds of November may be as high or higher than those of December, in fact there is no single month of which it may be said the winds are notably stronger than during any other month of the year. The heavy continuous lines on this, as on former charts, show the average paths of storms passing over the lake region, of which there have been 160 during the past twenty years, an average of eight per month."

It is announced that the navy department has remitted penalties to the amount of \$36,000 for the failure of the Bath Iron Works to complete the torpedo boat Dahlgren on time and other penalties amounting to over \$20,000 will probably be also remitted. This is the usual method of procedure where the completion of a naval vessel is delayed by inability to get material as was the case with this torpedo boat.

The new steamer Pathfinder of the United States Coast and Geodetic Survey, which has been described and illustrated in previous issues of the Review, has left San Francisco for Hawaii where the work of surveying and charting the channels and harbors will be prosecuted. In connection with this work surveys will be made for landings of the proposed Pacific cable.

CRITICISM OF INSPECTION SERVICE.

GENERAL DUMONT'S ANSWER TO A COMMUNICATION REGARDING BOAT DETACHING DEVICES SUBMITTED AT THE RECENT MEETING OF THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS.

Editor Marine Review: Referring to marked article in the Review of Nov. 23, under the title of "Severe Criticism of the Steamboat Inspection Service," by a Mr. James R. Raymond of New York, who I believe is the patentee of a boat detaching device, that has failed to meet the approval of the board of supervising inspectors of steam vessels for reasons that have been satisfactorily explained to congress in a report of which the following is an extract, your attention being called to the fact that the report of 1894 refers to the detaching apparatus of which Mr. Raymond is the alleged patentee, the exhibition of his device referred to therein having been given, if my recollection is right, under the personal direction of Mr. Raymond:

On Jan. 27, 1896, Mr. Chancellor, chairman of the committee on life-saving appliances, made the following report:

"The committee on life-saving appliances, having had under consideration the resolution of the house of representatives, presented to the board by the supervising inspector-general on Jan. 23, 1897, relating to equipments on ocean steam vessels, namely, lifeboats, boat detaching apparatus, etc., beg leave to report that said resolution of the Fifty-fourth congress, first session, house of representatives, dated Jan. 21, 1896, reads as follows:

"Whereas it has been repeatedly charged by the Buffalo Evening News and other leading papers, that ocean steamers are permitted to sail from American ports with life boat equipment utterly inadequate to accommodate the crew and passengers in case of accident; and

"Whereas it is further alleged in these same journals that life boats are frequently without the detaching hooks of the disengaging apparatus required by law; now, therefore, be it

"Resolved that the secretary of the treasury be directed to inform the house of representatives whether the present provisions for the safety of the public in ocean travel are adequate; and if so, whether such provisions are strictly carried out. Attest: A. McDowell, Clerk."

"In answer to the newspaper allegation in the resolution of the house of representatives 'that life boats are frequently without the detaching hooks of the disengaging apparatus required by law,' your committee are at a loss to comprehend exactly what is meant, but assume that what was intended to be said was that life boats are frequently not furnished—to quote the exact language of the law (sec. 4488, rev. stat.)—'with suitable boat-disengaging apparatus, so arranged as to allow such boats (life boats) to be safely launched while such vessels are under speed or otherwise, and so as to allow such disengaging apparatus to be operated by one person, disengaging both ends of the boat simultaneously from the tackles by which it may be lowered to the water.' If our assumption in this respect is correct, we would report that the allegation is mostly true, for though all boats are furnished with suitable hooks and disengaging apparatus, practically complying with the terms of the law, they are not furnished with the technically lawful disengaging apparatus, for the reason that no disengaging apparatus has yet been constructed that will allow a boat 'to be safely launched while such (steam) vessels are under speed,' while there are probably many such that will safely launch a boat with the steamer not under headway.

"After the law was passed, Feb. 28, 1871, requiring such impracticable apparatus as it does, a number of them were approved by this board and put in use on steam vessels, but two or three years' experience proved those that had been approved not only worthless but dangerous to life, and in consequence thereof the board, at its meeting held Jan. 31, 1873 (proceedings of 1873, p. 33), rescinded the approval of all such apparatus in the following preambles and resolution:

"Whereas the experience of this board is against the use of the disengaging apparatus heretofore approved and used as a life-saving instrument; and

"Whereas, in accordance with the provisions in the second subdivision of the eleventh section of the act of Feb. 28, 1871 (now section 4488, revised statutes), requiring this board to approve of all kinds of instruments, machines or equipments for the better security of life required by that act, presupposes that the right resides in this board to condemn and disapprove all such instruments, etc., as do not accomplish their objects; therefore,

"Be it resolved that all the action of this board heretofore approving of and regulating all kinds of boat-disengaging apparatus, be, and is hereby, repealed."

"Since the date of the action of the board as above quoted, the board has at each succeeding annual meeting had occasion to examine and experiment with various designs of disengaging apparatus, but has failed as yet to find one that would comply with that provision of the law heretofore referred to as being impracticable, and, in the opinion of your committee, impossible; the last experiment being with one claimed to be the best ever invented, yet which, on a practical trial, failed to operate four times out of six, thereby proving that any dependence that may be placed on such disengaging apparatus is so purely a matter of chance as to almost constitute its compulsory use a crime. Following is a verbatim report of the committee who witnessed the experiments referred to (proceedings 1894, p. 48):

"The committee on life-saving appliances, having had under consideration the communication of Lieut. Lucien Young, presented to the board by the supervising inspector-general on Jan. 18, 1894, relating to a boat-detaching apparatus, beg leave to report as follows: That on Saturday, Jan. 27, your committee, on invitation of Mr. Young, proceeded to the Potomac river to witness a test of the above-named apparatus, but were informed that they were not ready to make test; on Feb. 3, the following Saturday, however, six tests were witnessed by the committee from the United States steam tug Triton, four of which were unsuccessful; and your committee ask to be discharged from further consideration of

the matter. Signed Alex. McMaster, Geo. H. Starbuck, C. H. Westcott, Committee.

"In conclusion, your committee would earnestly recommend that section 4488, revised statutes, be amended by striking out in said statute all the words following the word 'apparatus' in the first paragraph of said section, thus leaving to the board of supervising inspectors discretion to approve disengaging apparatus that in their judgment is safe as well as practicable. All of which is respectfully submitted for the consideration of the board. Signed E. P. Chancellor, M. J. Galvin, W. H. Murdaugh, Committee."

This report was adopted by the following vote: Ayes—Messrs. Bermingham, Starbuck, Murdaugh, O'Neal, Tibbals, Thompson, Chancellor, Galway, Galvin, O'Brien and the supervising inspector-general; eleven.

Mr. Raymond in the last paragraph of his paper as published in the Marine Review, says: "The supervising inspector-general has asked that the statutes be amended so that the board might be enabled to select a proper device, giving as a reason that, according to the wording of the statutes, they are prevented from giving their approval of any device other than the one mentioned therein, namely, the one operated by one person, disengaging both ends of the boat simultaneously, etc., etc. Had he the welfare of the public at heart, would he, or the board of inspectors under him, find anything in the language of the statutes that would forbid the selection of any good device, the universal use of which would familiarize all sailors with its operation?"

From this it would appear evidently that Mr. Raymond has never heard of General Grant's saying regarding an obnoxious law when he was president, that the "way to get rid of such laws, is to enforce them." Instead of this way of proceeding, evidently, Mr. Raymond would have the members of the board of supervising inspectors violate their oaths of office by ignoring the law and acting on their judgment in cases in which he is pecuniarily interested, contrary to the statutes provided therefor, and thereby places his individual pecuniary interest in his detaching apparatus as superior to the moral obligations imposed on the members of the board of supervising inspectors. The law requires, as will be seen, that the "boat disengaging apparatus" shall be "so arranged as to allow such disengaging apparatus to be operated by one person disengaging both ends of the boat simultaneously from the tackles by which it is lowered to the water."

Mr. Raymond's apparatus is, or is claimed to be, "automatic"; that fact alone clearly places it outside the terms of the law as herein quoted. Mr. Raymond has recognized that fact, and has tried, but unsuccessfully, to remedy that defect, by placing a lanyard around the detaching fork, the ends held by a person in each end of the boat, who are supposed to simultaneously let slip the lanyards when the boat strikes the water, which they may do or may not, depending upon the length of training the men may have had; thus from a lack of possible concert between the two persons, inviting the main danger involved in disengaging the ordinary hooks; a danger the law evidently, in the language that has been quoted, was intended to guard against, by requiring the disengaging apparatus to be under the control of one person. That there is a practical danger in the method adopted by Mr. Raymond of preventing, by a lanyard around the detaching unhooking of his otherwise automatic hooks, to prevent their prematurely unhooking is shown in the following statement quoted from the New York Herald of Sept. 14, 1899.

"Gibraltar, Sunday.—The flagship Olympia with Admiral Dewey on board, left today for New York direct. On Friday the Admiral, accompanied by Flag Lieutenant Brumby, visited * * * the training ship Alliance. * * * The Admiral quite won the hearts of the boys. This was especially illustrated by one incident, which, while a sad one, brought out the Admirals' interest in them. On the morning of his visit, while leaving a boat, the lanyard on the detaching fork parted and one end of the boat dropped into the water, throwing a boy from the boat into the water, and breaking his right leg badly below the knee."

The undersigned has no information as to whether the detaching apparatus of the Alliance's small boat was of the Raymond pattern or not, but the accident, as described in the Herald article, would seem to indicate one constructed on similar lines.

JAMES A. DUMONT,
Supervising Inspector-General.

Office of U. S. Steamboat Inspection Service,
Washington, D. C., Nov. 27, 1899.

CLASSED IN THE GREAT LAKES REGISTER.

The following vessels were classed in Great Lakes Register of Cleveland during the month of November, 1899: Under special survey—Steamer Angeline. Under ordinary survey—Steamers Avon, C. W. Elphicke, Miami, Thomas Davidson, and schooners Amoretta Mosher, Annie M. Peterson, B. B. Buckout, Henry W. Hoag, John Martin, Nellie Redington and Plymouth.

The steamer Porto Rico, recently completed by the Craig Ship Building Co. of Toledo for Miller, Bull & Knowlton of New York, and which was taken to the coast via the St. Lawrence, has arrived at New York, and will proceed at an early date to Porto Rico, where she will be employed in the coasting trade around the island. The Porto Rico is 220 feet in length, 32 feet beam and 21 feet depth. She has capacity for carrying considerable freight and in addition has accommodations for twenty-four first-class, thirty-six second-class and 150 steerage passengers. She is fitted with triple expansion engines with cylinders of 18, 27 and 45 inches diameter and 30 inches stroke, to which steam is supplied from two boilers, each 11 by 11½ feet, and capable of a working pressure of 175 pounds. The speed of the Porto Rico is 15 knots.

Ship building in the Canadian provinces seems to be in rather a more flourishing condition, at least in so far as small craft are concerned, than for some time past. Between Halifax and Shelburne forty-five new wooden vessels are in course of construction, and some of them will shortly be launched. The aggregate value of these vessels is about \$225,000.

ABOUT SEVENTY-FIVE MILLIONS

WILL BE REQUIRED TO RUN THE NAVY ANOTHER YEAR—PROGRAMME FOR NEW SHIPS—ARMOR QUESTION—CONSOLIDATION OF BUREAUS—THE NEW DRY DOCKS—SUMMARY OF SECRETARY LONG'S REPORT.

WASHINGTON OFFICE MARINE REVIEW, 1345 PENNSYLVANIA AVE.
WASHINGTON, D. C., Dec. 6, 1899.

Recommendations of the secretary of the navy as to new ships were printed in these dispatches two weeks ago. As then noted, congress is asked to provide appropriations for eighteen new vessels. First, three armored cruisers of about 13,000 tons trial displacement, of a maximum draft at deep water load not to exceed 26 feet, carrying the heaviest armor and most powerful ordnance for vessels of their class, to be sheathed and coppered and to have the highest practicable speed and great radius of action; second, twelve gunboats of about 900 tons displacement, to be sheathed and coppered; and third, as recommended a year ago, three protected cruisers of about 8,000 tons trial displacement, carrying the most powerful ordnance for vessels of their class, to be sheathed and coppered, and to have the highest practicable speed and great radius of action. It is also recommended that if any of the foregoing vessels are authorized, the law should provide that in case satisfactory bids can not be obtained for their construction by contract, the department shall have authority to construct the same in the navy yards. In support of this proposed further increase of ships the secretary presents the following tables as showing what other great powers are doing, and from which it appears that only Italy and Japan laid down less tonnage than this country during the present year and that Italy alone has less tonnage under construction:

LAID DOWN IN 1899.

Nation.	Battleships.	Cruisers.	Torpedo vessels	Total.
	Tons.	Tons.	Tons.	Tons.
England.....	116,000	127,700	4,200	247,900
France	25,456	113,943	4,800	144,199
Germany.....	44,324	2,800	4,200	51,324
Italy	32,000	.....	1,800	33,800
Japan*.....	.....	.....	.....	.....
Russia	57,426	6,375	1,700	65,501
United States.....	36,970	(†)	4,191	.....
Monitors	12,940	.....	.....	54,101

* All vessels called for by Japan's first building programme are either completed or under way. It is rumored, however, that the following will be laid down in 1899: one cruiser, third class; two torpedo gunboats; twelve torpedo boats, first class; sixteen torpedo boats.

† In November, 1899, bids were received for six protected cruisers of 3,200 tons (contracts since awarded).

TOTAL NOW UNDER CONSTRUCTION.

Nation.	Battleships.	Cruisers.	Torpedo vessels	Total.
	Tons.	Tons.	Tons.	Tons.
England.....	251,700	267,080	*12,900	531,680
France	80,231	166,283	8,969	255,533
Germany	99,729	41,851	6,655	148,235
Italy	78,454	38,901	3,185	120,540
Japan	59,700	63,280	7,133	130,113
Russia.....	115,713	92,697	16,566	222,976
United States.....	94,715	4,935	10,646	.....
Monitors	12,940	.....	.....	123,236

* Approximate.

Another table in the report shows probable dates of completion of forty-nine naval vessels now under construction in different parts of the country. Notwithstanding delay through the inability of the contractors to procure armor and other material, it is stated that four battleships should be finished early next year and one in October. The three others under construction should be available, one in 1901 and the other two early in 1902. The cruiser Albany, now building in England, and most of the thirty-three torpedo craft, should be available during the coming year, and the four monitors in 1901. As already noted several times in these columns, little progress has been made with the designs for the three battleships and three armored cruisers authorized under the act of March last, owing to the provision prohibiting the department from contracting for the hull of any vessel authorized therein until a contract has been made for the armor within the limit of a cost of \$300 per ton. The secretary explains that the six unprotected cruisers for which appropriations were provided in this same act have been contracted for (note last issue of the Review) and that work on the design of gunboat No. 16, to replace the Michigan on the great lakes, has been suspended awaiting the modifications of the treaty with Great Britain, which are now under consideration.

THE ARMOR QUESTION.

Referring to the armor matter, the secretary says it is the most important question pertaining to naval construction at the present time. He enters into an account of the disadvantages encountered by the department on account of the act of March 3 last limiting the price to be paid to \$300 a ton. A total of about 21,458 tons of armor now required is not contracted for. The situation, in view of great advances in prices, and in view also of the fact that all leading maritime nations except the United States are now taking advantage of important improvements recently made in the manufacture of armor, is particularly unfortunate. The report urgently recommends that in the early days of the session congress enact such special legislation, by joint resolution or otherwise, as may be necessary to enable the department to make contracts early in the coming year for 7,358 tons of armor of the best quality that can be obtained in this country for the battleships Maine, Ohio and Missouri, which are under construction, and that the provision of the act of March 3, 1899, limiting the price of armor to \$300 per ton, and the restriction preventing the armored vessels therein authorized from being contracted for until the armor therefor is contracted for, be removed. "Whatever

may be the future action of congress regarding the establishment of a government armor factory," the secretary adds, "it can hardly affect the supply of armor for the Maine, Ohio, and Missouri, as it will under any circumstances be impracticable to obtain it from such a source in reasonable time to complete the vessels above referred to."

Estimates for the coming fiscal year, 1901, aggregate \$74,230,309.15, or an increase of \$25,025,239.57 over appropriations for the present fiscal year. The secretary explains that the increase is to be found in the three items of public improvements, the construction and repair of vessels and increase of the navy—construction and machinery. Attention is directed to the great increase in the naval establishment during the past year or two. The estimates are as follows:

NAVAL APPROPRIATIONS FOR THE PRESENT FISCAL YEAR COMPARED WITH ESTIMATES FOR THE NEW YEAR 1901.

Navy Department.	Appropriated, 1900.	Estimates, 1901.
Pay of the navy	\$13,500,171.00	\$12,805,297.00
Pay, miscellaneous.....	500,000.00	500,000.00
Contingent, navy	10,000.00	10,000.00
Bureau of navigation.....	505,125.00	454,375.00
Naval academy.....	195,153.45	207,813.45
Bureau of ordnance.....	3,143,124.00	2,503,124.00
Bureau of equipment.....	2,765,455.10	3,242,475.00
Bureau of yards and docks.....	453,442.23	533,322.83
Public works, yards and docks.....	5,840,786.50	13,768,474.32
Public works, naval academy.....	720,000.00	2,021,000.00
Public works, naval observatory.....	10,000.00	30,500.00
Bureau of medicine and surgery.....	192,500.00	180,000.00
Bureau of supplies and accounts.....	3,220,432.03	3,220,432.03
Bureau of construction and repair.....	3,273,407.00	6,295,824.25
Bureau of steam engineering.....	1,959,200.00	2,774,200.00
Marine corps.....	2,523,871.27	2,700,370.27
Increase of the navy; construction and machinery.....	5,992,402.00	18,733,101.00
Armor and armament	4,000,000.00	4,000,000.00
Equipment	400,000.00	250,000.00
Grand total.....	\$49,205,069.58	\$74,230,309.15

THE NEW DRY DOCKS.

As the government is now expending about \$4,500,000 on new docks—one floating dock and four graving docks—the secretary's reference to this subject is quite important, especially as the main feature of his report on this score is just as was expected—an urgent plea to congress to reconsider previous action and provide a small additional appropriation so that all four of the graving docks may be of masonry. For two of them—Mare island (Cal.) and League island (Penna.)—appropriations thus far made specify timber construction. Referring first to the docks under construction and about which there is no question, it is noted that the floating dock at Algiers, La., contracted for April 10 last, is to cost \$810,000 and will be ready for use in November, 1900; masonry dock at Boston, contracted for March 14 last, to cost \$1,013,400 and to be completed within the limit of two and one-half years; masonry dock at Portsmouth, N. H., contracted for Oct. 2 last, to cost \$1,089,000 and to be completed within the limit of two years. Then the secretary says of the other two dry docks:

"The docks for the Mare island navy yard and for the League island navy yard, which are to be of timber, were also advertised for bids upon plans and specifications prepared by the bureau of yards and docks, and contracts have been awarded for the entire work at \$729,000 for the former and at \$782,600 for the latter. These docks are of a capacity to receive the largest vessels of the service or those likely to be employed as auxiliary cruisers in time of war. The principal dimensions are: Length, 750 feet; width on the floor, 80 feet; draught at mean high water, 30 feet. In contracting for these docks the department has followed the requirements of congress as to materials, but experience in contracting for the masonry docks has shown that they can be built of the most substantial character, with the best equipment and within a reasonable period of time, at a cost very little in excess of the wooden structures. Coupled with this record of moderate cost for permanent and safe docks of the largest size is the unfortunate experience the department has had with practically all the timber dry docks it has constructed. In those cases in which there has been no alarming accident or failure the cost of repairs and renewals has been very great. In view of the facts the department strongly recommends that authority be given to modify the contracts for the timber docks and build them of concrete and stone."

RECOMMENDS CONSOLIDATION OF BUREAUS.

As had been expected, Secretary Long urgently recommends the consolidation of three important bureaus—construction and repair, steam engineering and equipment. "The consolidation of these bureaus," he says, "would be in the interest of good business organization and economy. These bureaus have to do with the construction and fitting out of vessels; in one word, the material of the ship. It is an integral work. When a contract is made for the construction of a ship, it is made with one builder. It is not given part to a constructor of hulls, part to a steam engine manufacturer and part to an outfitting firm. Whatever various trades enter into the work are all under one head. This is the method of private ship yards which build the largest ships and which are not left to the administration of three heads between whom delicate questions of respective authority and responsibility are liable to arise, resulting in delays and too often in friction and lack of harmony of co-operation. Each of these bureaus has now, during the construction of naval vessels, its separate inspectors at each yard. A consolidated bureau could, of course, be run much cheaper than three bureaus, and a great saving made by a reduction of the now three separate working forces, both clerical and mechanical, especially in our navy yards. Fewer naval officers would be needed, as there would be but one staff instead of three, so that more officers would be available for other duty. Under the

present system one bureau brings its work to the point of readiness for the work of another, which is not always ready for it. There is necessarily a lack of that adaptation and harmony of movement which one head would secure. If this consolidation were effected, the matter of furnishing coal and other current supplies, which is now under the direction of the bureau of equipment, could be easily transferred to the bureau of supplies and accounts, and such other incidental changes made as became necessary. This suggestion is made solely with a view to an improvement in departmental organization, and with the highest appreciation of the ability and dutifulness with which these bureaus have been administered under their present heads. Efficient as they have been, however, their consolidation is recommended, because it is believed that if consolidated under the direction of any one of their present heads, or of any competent officer, that efficiency would be still greater, less expense incurred, and a better business organization would succeed. The terms of office of the chiefs of the three bureaus will all expire in a little more than a year, two of those officers then going upon the retired list, and it is due to them all, as an assurance that the change is recommended on systematic and not personal grounds, to suggest that if made, it shall not go into effect until the beginning of the fiscal year after the expiration of their said terms."

INSPECTION OF MATERIAL—MORE CONSTRUCTORS—SUBMARINE BOATS.

Referring to the inspection of steel for modern vessels of war under the direction of the bureaus of construction and repair and steam engineering, the report says: "During the past year there has been inspected, tested and shipped 36,210,675 pounds of material under the bureau of construction and repair and 10,587,175 pounds of material under the bureau of steam engineering. A comparison of the specifications for the battleships Maine and Texas, issued in 1888 and 1889, respectively, with the requirements for the same class of material for the ships authorized May 4, 1898, shows the great improvements made in the manufacture of steel. In the case of the Maine and Texas, the specifications for shafting required a tensile strength varying from 56,000 to 70,000 pounds per square inch, with an elongation of 16 to 20 per cent in 2 inches, both depending on where the test piece was taken. The specifications for the new vessels require for these forgings a tensile strength of at least 95,000 pounds per square inch and an elastic limit of 65,000 pounds per square inch, with an elongation of 21 per cent in 2 inches. This result is largely due to the efficient system of government inspection at the works of the manufacturers."

The number of constructors now allowed by law is forty. This number is reported by the chief of the bureau of construction and repair, the secretary says, as insufficient to perform the arduous, increasing and responsible duties devolving upon the construction corps with the large amount of construction which is at present in progress. It is therefore recommended that this limitation as to the number of constructors be removed, and that it be left to the discretion of the secretary to appoint to this corps, from graduates of the naval academy, such additional assistant constructors as the demands of the service make advisable.

The secretary says on the subject of submarine boats that a series of requirements for the Holland type of boat, suggested a year ago by the board of inspection and survey, were fulfilled in the trials that took place early last month, and he is therefore of the opinion that the results thus far obtained are indicative of the very important possibilities of this type of naval war vessel.

RECORD CRUISE OF THE BATTLESHIP KENTUCKY.

The new battleship Kentucky, mention of the official trial of which was made in the last issue of the Review, has returned to the yard of her builders, the Newport News Ship Building & Dry Dock Co. The vessel's run down the coast at cruising speed under natural draft constitutes one of the most remarkable performances of the kind on record. From South Shoals the Kentucky ran 360 miles to Cape Charles in 24 hours, 7 minutes, making an average speed of 14.93 knots an hour under natural draft. A distance of 44 miles between Winter Quarter light and Hog island light the Kentucky made at the rate of 15.3 knots an hour, also under natural draft. From the time the battleship left Boston light until her arrival at Cape Charles, the trip consumed just 36 hours and the average speed for the entire distance was 14.6 knots.

The engine and fire room performances of the Kentucky on her official trial were even more favorable than those of the Kearsarge, for the reason that her propellers turned as rapidly, on an average, under a smaller head of steam. About 45 tons of coal were burned, or about 32 pounds an hour per square foot of furnace area, under three double-end and three single-end Scotch boilers. No water worth speaking about was used on the journals. The temperature of the engine room was about 120 degrees. The highest steam pressure developed was 172 pounds. The boilers and machinery worked smoothly for four full hours under forced draft. The average number of revolutions of the Kearsarge was 114.3; of the Kentucky 112.65.

Local inspectors John Monaghan and M. F. Chalk of Duluth seem determined to enforce navigation rules at the head of the lakes. Only a few days ago they suspended for six months the license of A. H. Kent, captain of the tug Industry, for a violation of rules that resulted in a collision between the steamer Peerless and barge A. Stewart on Sept. 7 last, and now it is announced that as a result of the sinking of the tug Record on Oct. 8 by the Rockefeller steamer Neilson, Capt. William J. Hunt, master of the Neilson, has been suspended for one year, and William Burnett, master of the Record, was suspended for four months. Both suspensions date from Dec. 12. The suspension of Capt. Hunt will probably be appealed.

The commission in charge of the transportation exhibit of the state of New York at the Paris exposition announces that the display will include the largest number of models of steam and sailing yachts ever brought together. More than thirty different types will be represented.

MERCHANT VESSELS OF THE UNITED STATES.

On the great lakes there are 399 steam vessels having a tonnage (gross register) of 1,000 tons or more. The aggregate tonnage of these vessels is 812,218, so that the average is 2,036 tons. In all other parts of the United States combined the number of such vessels (1,000 tons and over) is 258, the aggregate tonnage 584,899 and the average 2,290. It will therefore be seen that there are more steam vessels of large capacity on the lakes than are to be found in all other parts of the country.

These figures, as well as all others in the following tables are from the annual report of the United States commissioner of navigation, just issued, and which deals with the shipping of the United States on June 30, 1899. The tons are in all cases gross register tons. These tables also show that the fleet of steel vessels on the great lakes is fast assuming large proportions. There are 712 steel vessels (steam and sail) owned on the Atlantic coast, as against 296 on the great lakes, but the aggregate tonnage of the coast vessels is only 685,386, against 572,947 on the great lakes. The average tonnage of the lake steel ship, therefore, is 1,935 against only 962 for the Atlantic coast steel ship. On the Pacific coast there are only seventy-five steel vessels of 105,996 tons and on the western rivers only fifty of 11,313 tons.

STATEMENT SHOWING THE NUMBER AND TONNAGE OF VESSELS OF ALL KINDS OWNED IN THE UNITED STATES ON JUNE 30, 1899.

Districts.	Number of vessels.	Gross Tonnage.
Atlantic and Gulf coasts.....	16,275	2,614,869
Pacific coast	1,970	539,937
Northern lakes	3,162	1,446,348
Western rivers	1,321	263,084
Grand total	22,728	4,864,238
Sailing vessels	13,300	1,825,318
Steam vessels	6,837	2,476,011
Canal boats	629	71,101
Barges	1,962	491,808
Grand total	22,728	4,864,238

STATEMENT SHOWING NUMBER AND TONNAGE OF STEAM VESSELS OF 1,000 TONS AND OVER OWNED IN THE UNITED STATES ON JUNE 30, 1899.

Districts.	Number of vessels.	Gross Tonnage.
Atlantic and Gulf coasts	258	584,899
Pacific coast	66	131,123
Northern lakes	399	812,218
Western rivers	12	17,381
Total.....	735	1,545,621

STATEMENT SHOWING NUMBER AND TONNAGE OF VESSELS OF ALL KINDS OWNED IN THE UNITED STATES ON JUNE 30 OF EACH YEAR FOR TEN YEARS PAST.

June 30.	*SAIL.		STEAM.		TOTAL.	
	Number.	Gross tonnage.	Number.	Gross tonnage.	Number.	Gross tonnage.
1890	17,502	2,565,409	5,965	1,859,088	23,467	4,424,497
1891	17,683	2,668,495	6,216	2,016,264	23,899	4,684,759
1892	17,991	2,690,504	6,392	2,074,417	24,383	4,764,921
1893	17,951	2,641,799	6,561	2,183,272	24,512	4,825,071
1894	17,060	2,494,599	6,526	2,189,430	23,586	4,684,029
1895	16,686	2,423,159	6,554	2,212,801	23,240	4,635,960
1896	16,313	2,396,672	6,595	2,307,208	22,908	4,703,880
1897	16,934	2,410,443	6,599	2,358,578	22,633	4,769,020
1898	15,993	2,377,815	6,712	2,371,923	22,705	4,749,738
1899	15,891	2,388,227	6,837	2,476,011	22,728	4,864,238

* Includes unrigged craft.

STATEMENT SHOWING GROSS TONNAGE OF VESSELS OF ALL KINDS BUILT IN THE UNITED STATES DURING TEN YEARS PAST.

Year ending June 30.	On the Great Lakes.	On the New England coast.	On the entire seaboard, including New England coast.	On the Mississippi River and its tributaries.	Total.
1890	108,526	78,577	169,091	16,506	294,123
1891	111,856	105,491	237,462	19,984	369,302
1892	45,969	60,624	138,863	14,801	199,633
1893	99,271	37,091	102,830	9,538	211,639
1894	41,985	28,665	80,099	9,111	131,195
1895	36,353	26,783	67,127	8,122	111,602
1896	108,782	39,582	102,544	15,771	227,097
1897	116,937	21,942	103,504	11,792	232,233
1898	54,084	23,944	112,879	13,495	180,458
1899	80,366	68,761	196,120	23,552	300,038

STATEMENT SHOWING THE CLASS, NUMBER AND TONNAGE OF IRON AND STEEL VESSELS OWNED IN THE UNITED STATES ON JUNE 30, 1899.

Districts.	*Sail.		Steam.		Total.	
	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.
Atlantic and gulf coasts.....	44	45,591	668	639,795	712	685,386
Pacific coast.....	8	6,294	67	99,702	75	105,996
Northern lakes.....	68	121,802	228	451,145	296	572,947
Western rivers.....	.....	.....	50	11,313	50	11,313
Grand total.....	120	173,687	1013	1,201,955	1133	1,375,642

* Includes barges.

The shipfitters shop at the Boston navy yard was destroyed by fire, several days ago, and machinery contained therein was damaged to the extent of \$25,000 to \$50,000.

ELECTRIC MOTORS ON SHIPBOARD.

NAVY BUREAU OF ENGINEERING STILL DECIDEDLY OPPOSED TO THEM—HOWEVER GOOD ELSEWHERE, THEY ARE NOT YET ADAPTED TO DRIVING AUXILIARIES ON SHIPS—CLAIMS ON SCORE OF ECONOMY NOT TENABLE.

REAR-ADM RAL MELVILLE, U. S. N.*

For some time past—in fact, ever since the successful use of electric motors for general power purposes on shore—the bureau of steam engineering of the United States navy has been carefully investigating their adaptability to the driving of the numerous auxiliary engines on board ship, and, in view of the conclusion that the electric drive of the auxiliaries would not, under existing conditions, be so satisfactory and economical, on the whole, as the steam drive, believes it would be of interest to state the reasons for this conclusion. This is the more appropriate because in some quarters the fact that electric motors are extensively used on shore has led to the belief that they would be equally successful on board ship. The bureau has planned to use electric motors exclusively in its new plant at the Brooklyn navy yard, and it will be readily appreciated, therefore, that their non-use on board ship is for very good reasons. The advantages claimed for electric motors over small steam engines on board ship may be classed as greater ease of operation, avoidance of heat, which accompanies the use of steam pipes in living places, and much greater economy. Against these, however, are to be put the much greater weight of the necessary electric outfit, the greater delicacy of the type of electric motors ordinarily used, the lack of ready adaptability to the various conditions of service, a general denial of the claims for economy as ordinarily presented, and the increase in the amount of space required below the protective deck for the installation of the necessary dynamo rooms, this space being necessarily taken from coal bunkers.

On board ship, where excess of weight is so carefully guarded against, it would certainly be very unwise to adopt a change of motive power involving great increase in weight, unless the advantages gained are very material. It must always be remembered that, speaking generally, on board ship the use of an electric motor involves a total weight for the motive power at least three times that of the motor itself, because there is always the generator and its driving engine, besides the motors supplied by them; or, in other words, the electric drive of an auxiliary will weigh at least three times as much as the steam drive, assuming the motor to weigh no more than the engine it displaces, although usually it does weigh more. The answer which would be made to this is, of course, very familiar to anybody who has studied the problem, viz., that the auxiliaries are not all in use at one time, and that therefore the generator capacity required is considerably less than the total motor capacity. This is another case where a statement which may be true elsewhere is not true for the circumstances on board ship. Our naval machinery has to be designed so that in time of action everything can be ready for use, and, as a matter of fact, a very little study of the question will show that it not only may but almost certainly would happen that every auxiliary on the ship, except the capstan engine and some of the boat winches, would be used simultaneously. Therefore this statement with regard to the generator capacity does not hold on board ship. Another statement to which very emphatic objection must be entered is in respect to the enormous gain in economy claimed for the electric drive of the auxiliaries, which is obtained by taking the highest figure for the efficiency of the generator and motor and also the most economical steam engine, and by comparing these results with the uneconomical form of steam cylinders which, for very good reasons, have until recently ordinarily been used with the steam-driven auxiliaries. If the electric generator was of relatively large size and the motors worked always at their most economical speed and load there might be some justification for this claim; but, as a matter of fact, the very circumstances under which the auxiliaries on board ship are worked require a very wide range of speed and power, and I believe that electric experts admit that electric motors as at present designed when run under these conditions are by no means economical, so that, without considering the economy of the engine driving the electric generator, the economy of motor-driven auxiliaries at speeds differing materially from the most economical would be widely different from those which are set forth by the advocates of their universal use on board ship. The natural result of the foregoing is that, with the widely varying speeds of the auxiliary machinery, there is required at the generator the development of an almost constant power which is very near the maximum, and which depends only upon the number of auxiliaries in use.

I wish to emphasize the point that the objection to using electric motors for driving the auxiliaries on board ship is not an objection to the use of electric motors per se, but to installing them in a location for which they are not adapted and where their good features can not be utilized. What has led to the wide use of electric motors on shore is not only the absence of heat, cleanliness, and ease of installation and operation, but above all the simplicity of the transmission of power from a central station to a distance. Now the great majority of the auxiliaries on board ship are so near the boilers that less piping is involved in a direct steam drive than in an electric drive from dynamos necessarily at some distance from the boilers. The ease of transmitting power to a distance over a wire, as compared with great lengths of steam piping, gives the electric drive a very attractive side, even for distances no greater than the maximum ones on board ship, so that we should naturally expect to find electrically driven capstans and steering engines. These two auxiliaries are not under this bureau, but are the ones requiring long and objectionable steam pipes through the living spaces. Here, however, another point has been made by some who are very anxious to use motors elsewhere, viz., that for the service in these cases motors are not sufficiently reliable. Naturally a system involving four parts, each liable to break down, is more delicate than one involving but two of these parts. With a steam drive there are the boilers and

the steam engine driving the auxiliaries. In the electric drive we have the boilers, the steam engines, and also the electric generators and motors. It is merely a detail whether the steam engines operate the auxiliaries directly or whether a smaller number of them, having a greater power in each engine, operate electric dynamos. Personally I should think, however, that if motors are considered sufficiently reliable to drive feed pumps and air pumps on shipboard, for which they are not well adapted, they would be reliable for these other two cases noted, which they fit so well otherwise. The absurdity of an electric drive of auxiliary machinery on board ship situated closer to the main engines than the engines driving the dynamos becomes all the more apparent when contrasted with the steam drive for auxiliaries situated in the very extreme ends of the ship.

The fact is that within what are ordinarily called the "machinery compartments of the ship" the leading of the necessary steam and exhaust pipes for auxiliaries does not interfere with anybody's comfort nor does it raise the temperature unduly, and the distances are so short as to make the lead of piping very easy. Steam auxiliaries answer admirably the demands which come upon them at all speeds within their capacity, and the only possible objection which can be urged against them is that the simple forms usually employed for reliability are not so economical as the more elaborate ones which can be used elsewhere. They are far superior to electric motors on the score of adaptation to the service to be performed, and also far better for naval use on the score of weight. On the score of economy, we have shown above that the claims ordinarily made for the electric drive are not tenable, except under special conditions, and it is further to be said for the steam-driven auxiliaries that at the times when economy is of the greatest importance when making long sea trips, only a small part of the total auxiliary capacity is used, so that even if the saving by the use of electricity was what is claimed by the most enthusiastic electrical agents the aggregate amount of fuel saved would be comparatively insignificant and considerably less than the reduction in bunker capacity necessarily incident in a ship of a given size to the use of the electric drive. It must also be noted that all the published statements of the superior economy of electrically operated auxiliaries are based on steam auxiliaries where every steam cylinder was of the least economical kind, and where, for good reasons, well-known measures of economy had not been installed. An inspection of the bureau's recent designs will show that by the use of compound engines as motors, feed heaters for the exhaust, the use of the exhaust steam from the auxiliaries in the receivers of the main engines, and other economical devices, the expenditure of steam in the auxiliaries is brought much below that of the old simple engines, and indeed below that of the electric drive except under very favorable conditions, while avoiding the increased complication and weight which necessarily accompany electrically driven auxiliaries on board ship. I may be permitted to call attention in this connection to the fact that those designers abroad who have the most extended experience are working on this problem of the economy of auxiliaries along the same lines that the bureau has been following. Although the statement is very often made that the electric drive of the auxiliaries is being rapidly adopted in all foreign navies, this is far from accurate. It is being tried on some ships in some navies, but is as yet entirely in the experimental stage. These experiments have been carried quite as far in our navy as in any other.

I think I may be pardoned for saying that those who are most insistent on the electric drive are not at all conversant with the conditions obtaining on board ship, while those of us who have spent a lifetime in the care and design of naval machinery may fairly claim that we know something about what is needed. It is perfectly safe to say that when electric machinery can be used more advantageously than steam for driving ships' auxiliaries the change will be made very promptly. Knowing, as they do, that as at present designed electric machinery, however good elsewhere, is not yet adapted to driving the auxiliaries on board ship, the bureau chiefs would be incompetent if they yielded to the craze for new things and made a change which would result in increase of weight and complication, lack of economy, dissatisfaction, and the decreased efficiency of the fleet. In this connection I desire to submit the following facts and calculations:

On the battleship Alabama the space required for electric motors, where used, is approximately the same as that required for steam engines to do the same work. The space required for the wiring, etc., is less than that necessary for steam piping, had that been used. The space required for the generating sets is 10,140 cubic feet. The capacity of these generating sets is 256 kilowatts total. If all the auxiliary machinery on board this ship were operated by electricity, and if the space required for the electric generators were increased in the ratio of the increase of necessary capacity in the generating room, the space that would be required in the generating rooms would be 50,700 cubic feet for a capacity of 1,280 kilowatts. Consequent upon the extension of the use of electricity would be an increase in the total weight of the machinery equal to from 150 to 250 tons as a minimum. This loss in weight is as much as the gain following the use of water tube boilers. The increased space occupied by the larger generating rooms would accommodate 900 tons of coal, or 3,600 horse power could be added to the power of the propelling engines, giving the ship in the first instance 45 per cent greater coal endurance, or in the second instance 1.5 knots increase in speed. The figures as to the space required for the installation of larger generating sets are undoubtedly excessive, but they are based upon the present practice. It seems to me that at the best we would at present have to pay an excessive price for electricity. This weight and space required would be very much less if the size of the electric generating units could be largely increased without loss to the efficiency of the ship. At present, however, it is necessary for the efficient operation of the turret-turning machinery and of the ammunition hoists that small units be used, for these purposes at least. Probably when the designers of electrical machinery for naval use give as much attention to the development of designs to suit naval conditions as they have already done in commercial work this necessity will be overcome.

I consider that the turbine engine has a distinct field as an electric

* From the annual report of the Engineer-in-chief, United States Navy.

generating engine, especially on shipboard. When the design of naval electrical machinery is sufficiently advanced to justify the use of large units the advantages of turbine engines will cause a great saving in weight and space. The operation of electrical machinery is purely mechanical. That this may be done efficiently requires good mechanical ability at the generating engines. Electric difficulties and casualties are almost always questions of mechanical engineering. I know that it would conduce to the efficiency of the service, to the feasibility of a more extended use of electricity, and to an increase in the life of electrical apparatus if the electric generating plant were placed in charge of this bureau of steam engineering. It is almost the universal commercial practice to place electric generating plants in the charge of mechanical engineers.

MC CREERY VENTILATING SYSTEM.

HOW AIR, COOLED AND CLEANSSED OF IMPURITIES, WITH HUMIDITY REGULATED, IS DISTRIBUTED BY MEANS OF NOVEL DEVICES TO ALL PARTS OF A SHIP.

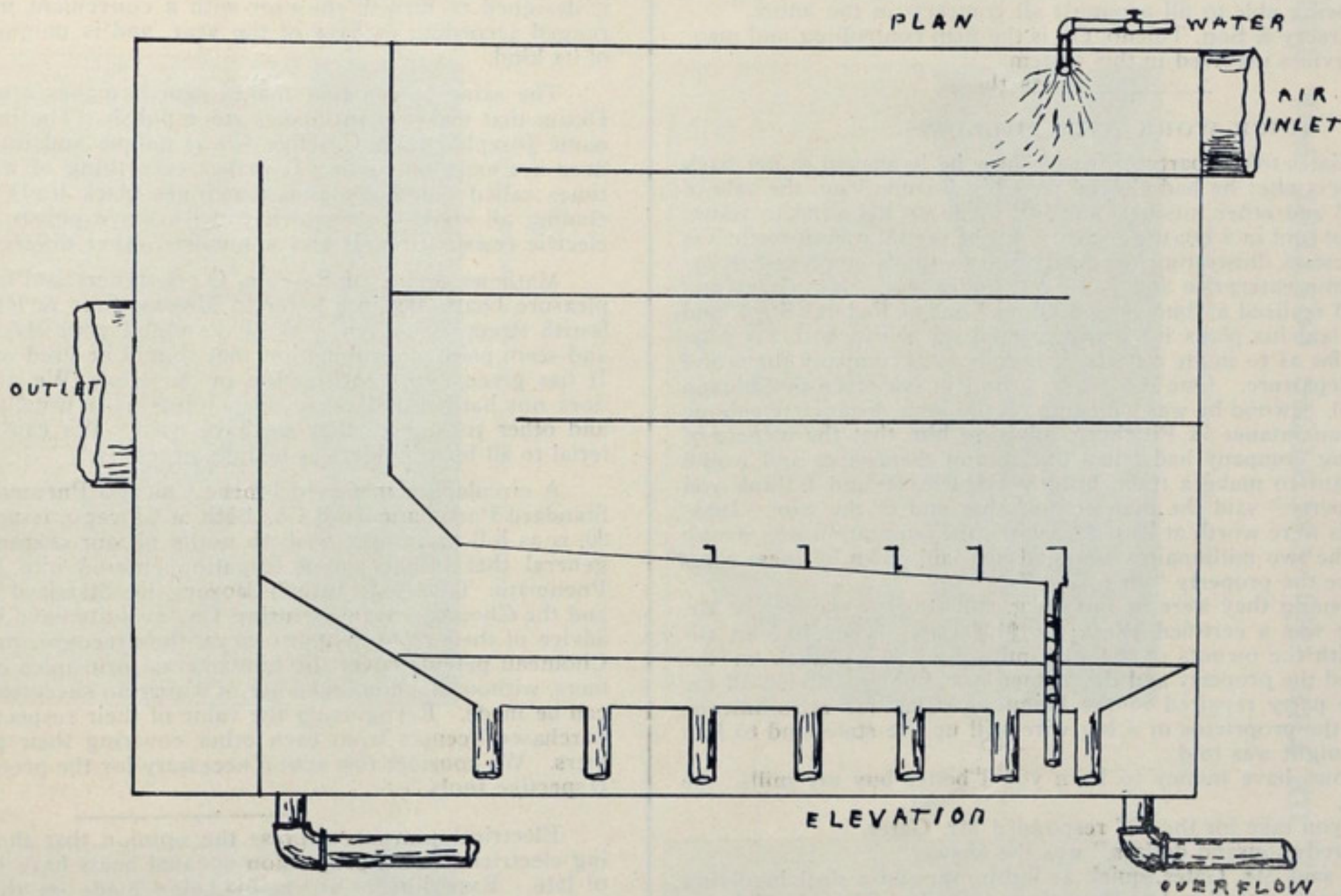
Up to a few years ago the problem of ventilating steam vessels, and especially those engaged in passenger traffic, had been a source of a great deal of trouble to managers of steamboat lines. On such vessels, for instance, as those of the famous Fall River Line, the Old Dominion ships trading down the Atlantic coast from New York, the large side-wheelers of the Detroit & Cleveland Navigation Co. and the Cleveland & Buffalo Line on the great lakes, and more particularly on government transports, all kinds of devices had been tried to overcome heat and foul air, but they were in most cases dependent upon a system of blowers, with no systematic cleansing and cooling of the air, and with no appliances for distribution of the air where difficulties were encountered but where ventilation

number of outlets, and could see no sign of dust on the cloths." The Jamestown and Yorktown, of the Old Dominion line, on which the McCreery system is used, are extensively engaged in carrying green vegetables, berries, etc., for northern markets, and since the installation of this system the cargoes carried by these vessels have invariably sold at prices at least 20 per cent above prices paid for similar cargoes carried on vessels not provided with such means of ventilation.

In a recent circular Mr. McCreery says: "There are no impracticable or visionary ideas connected with the McCreery ventilating system. It is not an aggregation of scientific monstrosities. It appeals to the common sense of every practical man, and the longer it is used, the more thoroughly it is approved. The utility of its many appliances has been proved in actual use under conditions which can leave no doubt of their efficiency." He says further: "No ship or building can be properly heated and ventilated without the use of individual heaters. No air is fit to breathe after the life of it has been burned out by being heated to from 100 to 200 degrees in a furnace or over steam coils and then forced to different parts of the ship or building."

On the great lakes the McCreery system is in use on the steamers North Land and North West of the Northern Steamship Co.'s fleet, City of Erie and City of Buffalo of the Cleveland & Buffalo Line, Manitou of the Lake Michigan & Lake Superior Line, all the big side-wheel steamers of the Detroit & Cleveland Navigation Co. and those of the Richelieu & Ontario Navigation Co., as well as the Pennsylvania, a trim side-wheel passenger steamer operating between Erie and Buffalo on Lake Erie. It is also in use on the Sound steamers Priscilla, Puritan and Plymouth of the Old Colony Steamboat Co.'s fleet and on the Jamestown and Yorktown, Princess Anne, Hamilton and Jefferson of the Old Dominion line.

It would certainly seem from reports of the surgeon-general of the United States navy, that some attention should be given in the construc-



was most desired. Even in dining rooms below the main deck on some steamers, otherwise of the finest appointments, there was all manner of complaint on this score.

But with the progress that has been made in overcoming other unsatisfactory conditions aboard ship, this matter of ventilation is also being solved. The heads of steamship lines above referred to have one after another adopted what is known as the McCreery system of ventilation and have in every case applied it to new vessels after it had first been tried on their ships in commission. After the air is first cleansed and cooled by this system, it is made to enter by means of novel devices places which it would seem almost impossible to ventilate. The ships on which the system is used—all of them the finest in the country—are its best endorsement. Frank E. Kirby, who has probably designed more fine passenger steamers than any other engineer in this country, and who was engaged by the war department during the encounter with Spain in the very important duty of fitting out the government transports, says of this system: "I consider it the only practical system of ventilation suitable for steamers, providing as it does fresh air, under control in every part of the vessel, and requiring no special care to secure the best results."

The McCreery system reduces the temperature of the air to within 2 degrees of the water used and removes all dust, dirt and germs of disease of whatever nature, without the use of ice or chemicals. Perfect ventilation cannot be accomplished by the simple use of fans, which, while they may keep the air in motion, do nothing whatever in the way of removing the impurities. The McCreery system is so arranged that the temperature of each room or compartment of ship may be regulated separately.

Capt. Dole of the Old Dominion Steamship Yorktown, says of the use of this system of ventilation, on his vessel: "I tried throwing a bucket of coal dust into the intake pipe with white cloths tied over a

tion of vessels of war to such a system of ventilation as that here described. Take, for instance, the experience of the United States Monitor Amphitrite in 1895 on its first sea voyage, as recorded in the ship's log. While under way, with the temperature of the outside air varying from 50 to 72 degrees, the thermometer in the engine room registered from 120 to 140, and in the fire room from 140 to 160 degrees. On June 25 at Hampton Roads the thermometer in the engine room registered 138 to 158 degrees and in the fire room 157 to 170. Under such conditions nothing like the maximum steam pressure could be maintained, and the full-power effort resulted in a mean speed of 7.27 knots for less than two hours. On June 26 the log shows eight members of the engineer force on the sick list, overcome by the heat, and only four firemen and four coal passers able to remain in the fire room. Into one place above the boilers where the air was confined, a thermometer was lowered by means of a long pole, and when it was withdrawn it registered 202 degrees. The great internal heat rendered the Amphitrite insufficient was, of course, to a large extent due to lack of provision for ventilation in the engine and boiler spaces, and this criticism may be applied to nearly all the vessels of the navy. At the works of the Cramps, Philadelphia, on Oct. 12 last tests of this system as applied to the United States transport Thomas were witnessed by Capt. W. S. Moore, senior inspector of machinery for the United States navy; Lieut. Commander Hall and Mr. Dobson, also stationed at the Cramp works; Messrs. Stchensnovitch and Tchernigovsky, representing the Imperial Russian navy in the construction of war vessels at the Cramp works, and Geo. A. Anthony, United States supervising inspector. In the ventilation of this ship four No. 90 direct-attached fans are used, each driven by one 7x5 double engine, and nine direct attached electric fans are used for exhaust and closet systems. The test was made with one of the direct attached engines for incast system, with engine running at 500 revolutions per minute, delivering 25,000

cubic feet of air per minute. The velocity of air passing into air cleansing and cooling device attached to fan was 1,000 feet per minute; discharge velocity in hospital, nearest available place to fan, 940 feet per minute; in lower hall troop deck, the farthest point from fan, 950 feet; area in hospital, 28.25 square inches; lower deck, 16.00 square inches. Two tests were made in reduction of temperature of air by means of air cleansing and cooling device and humidity regulator. Both times the air on deck was 80 degrees and the water used 59 and a fraction and 60 degrees, respectively. The air as delivered after passing through air cleansing and cooling device was at 61 and 62 degrees respectively.

Referring to these tests, Mr. McCreery says: "This shows only what we have often before proven, that we can reduce the temperature of air to within 2 degrees of water obtainable for such purposes, and at the same time cleanse it from all dust and dirt. We have also proved that we can deliver air to all parts of a ship or building practically at a uniform velocity. The plans for the cooling, heating, cleansing and ventilating, and the manner of distributing the air, are our own, and nearly all of the essential parts are patented and manufactured by us. Tests made in all parts of ships ventilated by us, with either incast, exhaust or closet system, have shown the same results. We have also installed our system in United States transport Logan, the same as in the Thomas. We claim for our devices superiority over others in that we deliver more air, clearer and better air throughout a ship, and that it is better distributed and under better control, with less power, than in any other system. All machinery, material and workmanship are of the best. We invite the closest inspection by managers of steamship lines carrying passengers or fruits and vegetables. We have nineteen patents covering different devices. A large number of them relate to air cleansing and cooling devices, which are made in different ways. Then we have patents on adjustable elbows with cut-off attachments, shutters, gates, etc., and also on method claims for distributing air at varying angles. With our contemplated enlarged facilities we are in hopes of being able to fill promptly all contracts in the future."

Joseph McCreery & Son, Toledo, O., is the firm controlling and manufacturing the devices involved in this system.

QUICK WORK WITH MILLIONS.

John W. Gates told a party of friends how he happened to get back into active business after he had cleared up a big fortune from the sale of Federal Steel and other interests and had made up his mind to retire. The story was not told in a boasting spirit, but the recital was nevertheless one of live interest as illustrating the whirlwind methods employed in organizing a gigantic enterprise and getting it under way. Mr. Gates and Col. Elwood had realized a "bunch of millions" out of Federal Steel, and the former had laid his plans for a trip around the world with his wife, having gone so far as to invite a party of friends to accompany them and fix the date of departure. One day while sitting in his office in Chicago chatting with Col. Elwood he was called up on the long-distance telephone system by an acquaintance in Pittsburg, advising him that the owners of a big wire milling company had fallen out among themselves and would sell. "If you want to make a trade bring on \$1,000,000 and I think you can get the property," said the man at the other end of the wire. Inasmuch as the mills were worth at least \$2,000,000, the temptation was strong to buy them. The two millionaires who had just laid down business cares concluded to take the property "for a flyer."

The next evening they were in Pittsburg, and snugly reposing in Mr. Gates's cardcase was a certified check for \$1,000,000. They had an all-night session with the owners of the wire mills, and at 5 o'clock in the morning they had the property and the former stockholders carried off the big check. The party repaired to the Duquesne Club for refreshments. There they met the proprietor of a big wire mill up the state, and to him the story of the night was told.

"If you fellows have money to burn you'd better buy my mills," he said banteringly.

"What will you take for them?" responded Mr. Gates.

"Nine hundred thousand dollars," was the answer.

"It's a go," said Mr. Gates, quick as lightning, and a deal involving nearly \$1,000,000 was closed in less than sixty seconds. The two Chicago men then communed briefly and Col. Elwood remarked: "John, if we are going into the wire business we must have a base of supplies. Better see if we can't buy the Cleveland Rolling Mill Co.'s works." Taking the first train out of Pittsburg they proceeded as fast as steam could take them to the Forest City. That evening they broke in on Wm. Chisholm with the blunt statement that they had come to buy his property, which included rolling mills, steamships, iron mines, etc.

"But I don't want to sell," he protested. "Still," he said, hesitatingly, "I would like to hear your proposition. What are you prepared to offer?"

"Five million dollars cash," was the reply. And then Mr. Gates added: "Five million dollars is a big bunch of money. Better think it over."

"I want more money," expostulated the Cleveland man.

"We will give you \$5,000,000 and not a dollar more."

The gentlemen met later in the evening and before midnight the trade was closed, the old owners stepping out and the new stepping in. The "cleaning up" yielded \$2,540,000 in cash, so that the property really cost Gates and Elwood \$2,550,000. It was worth from \$7,000,000 to \$8,000,000 without the cash. The next morning the Cincinnati Enquirer had the story of the Pittsburg deal, and the telegraph brought an offer of some valuable wire plants in and near that city. Mr. Gates repaired at once to Cincinnati and Col. Elwood hastened east to negotiate for valuable plants in Massachusetts. Forty-eight hours later they met in New York and on comparing notes found they had invested \$12,000,000 of their cash in wire plants. All that happened during the week between Christmas and New Year, less than eleven months ago.

"It looks as though we were in the business," said Mr. Gates. "A fair nucleus," responded Col. Elwood. "Let us go home." They cannon-balled to Chicago and in less than another week arrangements were practically consummated for the giant consolidation known as the American Steel & Wire Co.—capital, \$90,000,000. Jan. 18, or a little over three

weeks from the date of that long-distance telephone conversation between Chicago and Pittsburg, the constituent properties were duly turned in and the Steel & Wire stock was distributed according to arrangement. This, in brief, is the inside history of one of the "lightningest" deals for its magnitude ever negotiated. It was a Napoleonic campaign from start to finish. It is not recorded that either Mr. Gates or Col. Elwood lost money on the transaction. Mr. Gates called off that trip around the world.—Chicago Post.

TRADE NOTES.

Stationary engineers and steam users of the great lakes region will be pleased to learn that Mr. Frederick B. Slocum, well known to the pump trade, has again opened an office in Detroit at room 69 Newberry building, where he is handling the A. A. Griffing Iron Co.'s Bundy steam specialties.

The United States light-house board has accepted the bid of the Lebanon Chain Works, Lebanon, Pa., of \$46,044.25 for the supply of chain for light vessels. The bid was not the lowest submitted but the reputation of the chain turned out at the Lebanon Works was such as to secure the contract for them.

The American Blower Co. of Detroit, Mich., has just issued a handsome catalogue of their heating and ventilating apparatus. The American company is well known to ship owners, having provided a large number of blowers for steamers of both the great lakes and the coasts that are fitted with forced draft.

The Columbia desk calendar, which has been regularly issued for the last fifteen years by the Pope Manufacturing Co., Hartford, Conn., makers of Columbia bicycles, is now being distributed. The company will send the calendar to any address upon receipt of five 2-cent stamps. It is designed to furnish the user with a convenient memorandum pad, arranged according to days of the year, and is unique among publications of its kind.

The same Dixon that makes pencils makes crucibles, and the same Dixon that makes paint makes stove polish. The industry known by the name Joseph Dixon Crucible Co. is unique and immense. Its duplicate does not exist on earth. It makes everything of which graphite (sometimes called plumbago and sometimes black lead) is an ingredient, including all kinds of crucibles, pencils, stove polish, paint, flake graphite, electric resistance rods and a hundred other different things.

Mathews & Co. of Bascom, O., designers and builders of high-grade pleasure boats, say in a letter to Messrs. Cole & Kuhls, foot of Twenty-fourth street, Brooklyn: "We have found your elastic seam composition and seam paint a combination that should be used on all first-class boats. It has given entire satisfaction in our work. We notice that the cement does not harden and cause open joints as is usually the case with putty and other substances that we have used. We can recommend this material to all boat builders as being a necessity."

A circular letter signed by the Chicago Pneumatic Tool Co. and the Standard Pneumatic Tool Co., both of Chicago, issued under date of Nov. 29, is as follows: "We wish to notify all our customers and the trade in general that in the patent litigation entered into between the Chicago Pneumatic Tool Co., Joseph Boyer, the Standard Pneumatic Tool Co. and the Chouteau Manufacturing Co., all suits have been dismissed by the advice of their respective attorneys, they recognizing that the Boyer and Chouteau patents cover the fundamental principles of all pneumatic hammers, without the combined use of which no successful pneumatic hammer can be made. Recognizing the value of their respective claims, they have purchased licenses from each other covering their present style of hammers. We consider this action necessary for the protection of users of our respective tools."

Electrical journals express the opinion that the prospects of applying electricity to the propulsion of canal boats have been especially bright of late. Experiments are again being made on the Erie canal, and in Germany official approved of the use of electricity on the canals has recently been announced. It is understood that tests for the Dortmund-Ems canal, which have been pushed so vigorously by the emperor himself, have resulted in the adoption of a system employing a hauling electric locomotive on a light track, the inner and outer rails of which form the circuit. The results have been so satisfactory that the government has under consideration the question of equipping in this way all the canals under its control.

In the Firth of Forth, Scotland, there was held recently an oil fuel trial of the tank steamer Syrian, built by the Grangemouth Dock Yard Co. for the carriage of petroleum in bulk for the eastern trade. The coal trials were very successful and the trial with oil fuel was even more so, the speed attained being 11½ knots, or fully a knot more than with coal. The number of revolutions was seven to eight more per minute and the horse power 200 more than on the coal trial. The consumption of oil at the trial was found to be 25 per cent less per horse power than the consumption of coal.

Capt. Moses Humphrey, who took the steel steamer Porto Rico from the Craig ship building works at Toledo to New York city, is enthusiastic over the new Soulages canal, which is the principal work of the St. Lawrence system. The entire distance of 14 miles of the new waterway was made by the Porto Rico in 3 hours 15 minutes, three locks with a drop of 22½ feet each being passed in 48 minutes. Every lock is worked by electrical power, and the captain says that not a single minute is wasted in getting vessels up or down.

Naval authorities at Washington have had their attention called to the fact that the opening of the enlarged St. Lawrence canals will make the great lakes accessible to 140 modern war vessels of the British navy—in other words to all such vessels measuring 265 feet in length or less.

It is understood that President Morse of the New York Ship Building Co., Camden, N. J., will not erect at the new Camden works any of the large traveling cantilever cranes such as are in use at the Cramp and Newport News yards, as it is the intention to construct huge ship sheds, so that vessels may be built under cover as is the case in some of the European yards and at San Francisco.

VALUE OF STOCKS—LEADING IRON AND STEEL INDUSTRIALS.
Quotations furnished by HERBERT WRIGHT & Co., Cleveland,
date of Dec. 6, 1899.

NAME OF STOCK.	OPEN	HIGH	LOW	CLOSE
American Steel & Wire.....	46¾	46¾	43¼	45¼
American Steel & Wire, Pfd.....	95	95	93½	93¾
Federal Steel	60½	60½	58¾	60½
Federal Steel, Pfd.....	80½	80¼	79	80¼
National Steel	45½	45½	41	43¼
National Steel, Pfd.....	94	94	93	93½
American Tin Plate	32	32	28¾	30
American Tin Plate, Pfd.....	81	81	75	80
American Steel Hoop.....	46	46	42½	45½
American Steel Hoop, Pfd.....	82½	82½	81½	82
Republic Iron & Steel	24¼	24¼	23½	23¾
Republic Iron & Steel, Pfd.....	69½	69½	69½	69½

A bill has been prepared and will be submitted to congress providing for the establishment of a marine hospital at Buffalo. The building contemplated is to cost \$125,000 and would have accommodations for from sixty to seventy-five beds.

CAPT. GEO. A. SIMPSON, Expert Compass Adjuster,
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Steamers Superior and Duluth. Suited to ice crushing purposes. Good excursion boats—1,000 to 1,500 capacity each.
Euclid Beach Park Co., Cleveland, O.

Dec. 7.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., November 30, 1899. Sealed proposals for Pier Extension at Saint Joseph, Mich., will be received here until 3 P. M., December 30, 1899, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs.
Dec. 28

AMERICAN WOOD FIRE-PROOFING CO.

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J. S. H. CLARK, Vice-President.

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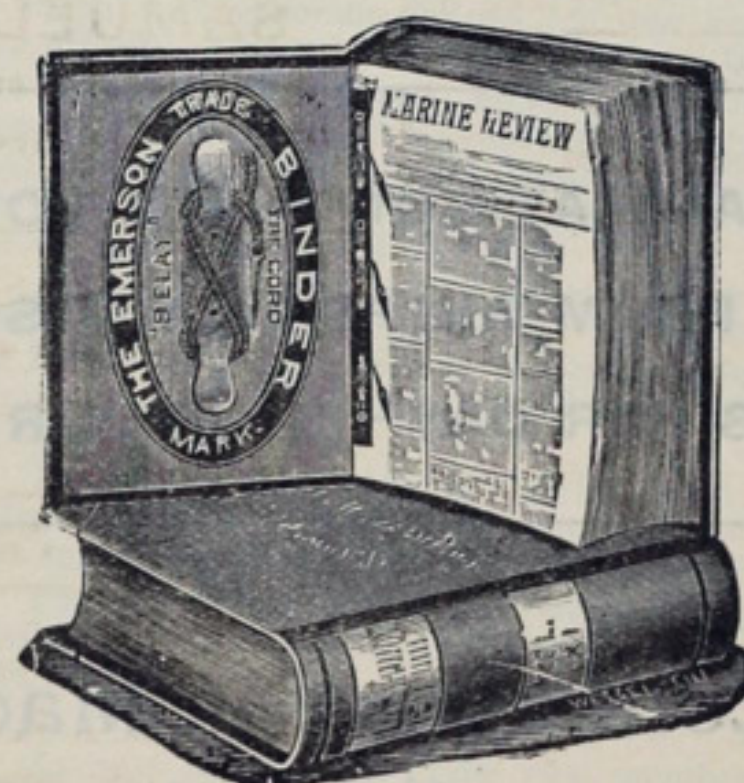
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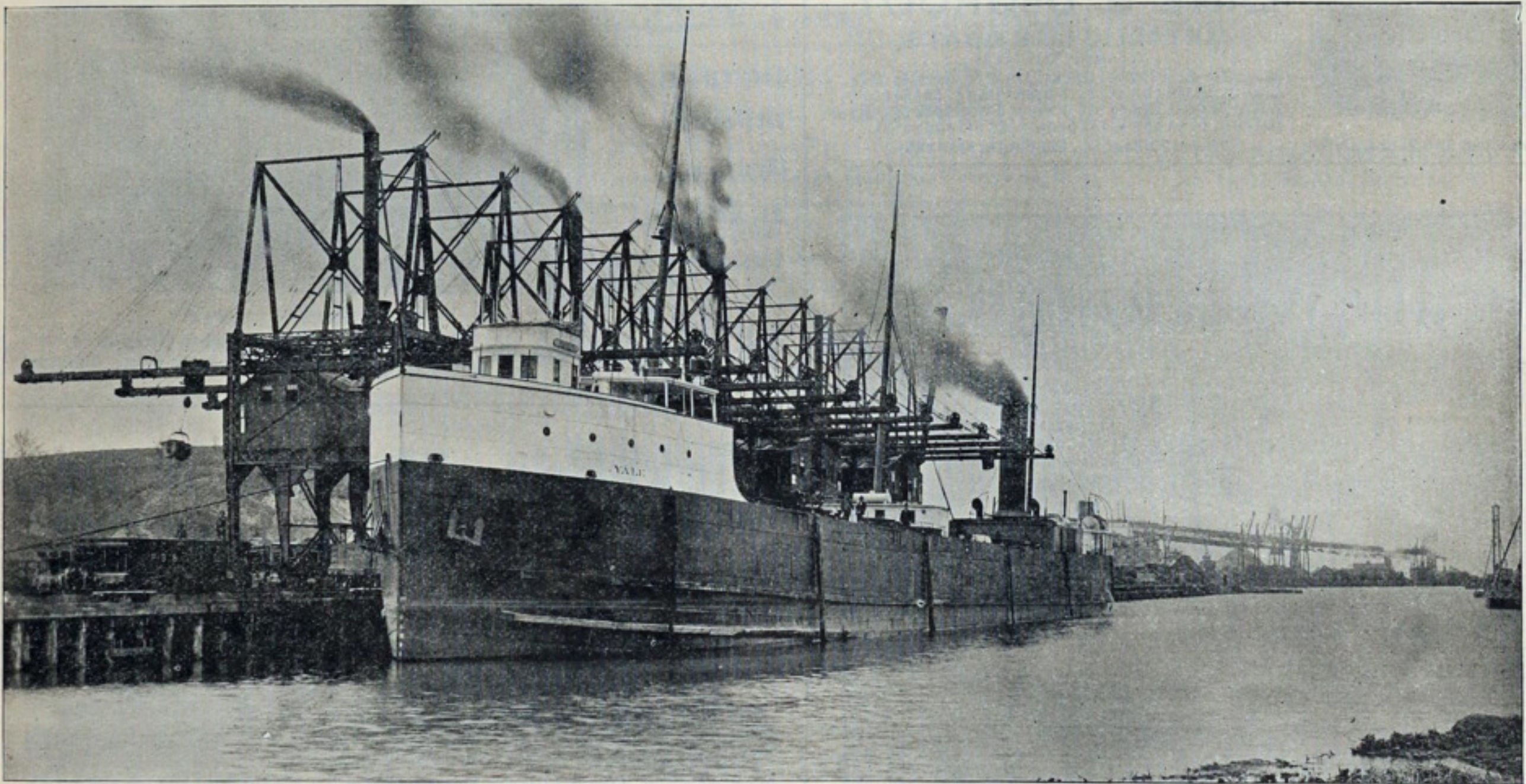
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